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ABSTRACT

This document explores the issues raised during the international workshop on asset management of postsecondary education institutions, as well as presenting the full transcripts of the workshop papers and providing summaries of working group outcomes. The overall themes the workshop addressed concern the impact of technology on facilities planning, the tensions developed from attempting to make the best use of assets by extending the range of users and providers, the impact of student-centered funding and student-centered learning on facilities management, and space and accommodation needs driving the development of planning standards. The papers address what impact information technology has on space requirements, what steps institutional managers can take to manage risks in rapidly-changing circumstances, the changing roles of facilities managers, and what new skills and tools they will need to be more effective in the future. Concluding comments discuss how the universal move to implement lifelong learning and information technology will be the two dominant forces influencing the policy environment, changing: the delivery of educational programs and altering the physical facilities required. (GR)

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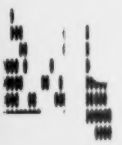



# STRATEGIC ASSET MANAGEMENT FOR TERTIARY INSTITUTIONS

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Programme on Educational Building

PEB PAPERS

# *Strategic Asset Management for Tertiary Institutions*

PROGRAMME ON EDUCATIONAL BUILDING
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

3

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The overriding concerns of the Programme are to ensure that the maximum educational benefit is obtained from past and future investment in educational buildings and equipment, and that the building stock is planned and managed in the most efficient way.

The three main themes of the Programme's work are:

- improving the quality and suitability of educational facilities and thus contributing to the quality of education;
- ensuring that the best possible use is made of the very substantial sums of money which are spent on constructing, running and maintaining educational facilities;
- giving early warning of the impact on educational facilities of trends in education and in society as a whole.

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# FOREWORD

This book is based on the proceedings of a two-day international workshop organised under the auspices of the OECD Programmes on Educational Building (PEB) and on Institutional Management in Higher Education (IMHE) for institutional and system managers responsible for infrastructure investment and management. It took place in July 1998 in Sydney, Australia.

The OECD wishes to thank the New South Wales Department of Education and Training for their generosity in hosting the workshop, and in particular Brian Frankham for his support during its preparation.

The workshop was facilitated by Michael Sachsse and Angus Moir, who also prepared this publication.

This book is published on the responsibility of the Secretary-General of the OECD. The opinions expressed are those of the authors and do not necessarily reflect the views of the Organisation.

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## TERMINOLOGY

The term "tertiary education" is now preferred by the OECD to describe all formal education beyond secondary education, whether or not it is immediately sequential, on condition that it is of a level which presupposes the successful completion of secondary education or an equivalent level of competence. The OECD describes tertiary education as being "provided in such institutions as universities, colleges, polytechnics (and importantly, if less commonly) in other institutional settings such as enterprises and community settings, and it may be either highly specialised and technical in subject matter, or an extension of secondary education. The point of the definition is to emphasise a level or standard and a sequence of studies rather than to specify a particular institutional setting or settings" ("Thematic Review of the First Years of Tertiary Education – Comparative Report", OECD, 1996).

However, readers should note that some of the contributors to this collection refer specifically to "further education" and "higher education". While respecting the OECD understanding, no change has been made to the terms used by the contributors to this report where their definitions have been different.

# INTRODUCTION

## BACKGROUND

The international workshop "Strategic Asset Management for Tertiary Institutions", organised by the OECD Programmes on Educational Building and on Institutional Management in Higher Education, was attended by some forty participants who included facilities planners and facilities managers, policy officials and academic administrators at the senior level. A wide range of tertiary institutions and education systems internationally were represented, presenting participants with opportunities to compare facilities policy and practice regimes which were often very different from their own.

The workshop adopted a highly interactive process to ensure that productive outcomes would be achieved.

The guest speakers were invited to open the workshop by briefly introducing five themes chosen as central to the issues of strategic asset management. These themes were then developed further in working groups as the workshop progressed, punctuated with the presentation of expert papers by the guest speakers. Presentations by David Rowland, General Manager of Properties of the New South Wales Department of Education and Training, and Peter Coaldrake, Deputy Vice-Chancellor of Queensland University of Technology, completed the inputs.

The working groups explored future scenarios and outlined action plans with the purpose of enabling facilities managers to play a proactive and more central role in the overall strategic development of tertiary institutions of the future. The outcomes from the working groups were recorded and presented to the full session. The key issues raised and conclusions reached are reflected below.

The full transcript of the workshop papers and summaries of working group outcomes are provided in the following chapters.

## SETTING THE CONTEXT

The themes which set the context for the workshop were introduced as follows:

Hans Antonsson, Managing Director of the *Akademiska Hus i Umeå* AB, Sweden, introduced the topic "The Impact of Information Technology on Facilities Planning". He advanced the suggestion that future information technology would require less special accommodation, and a trend towards smaller computers would mean less space would be needed. He pointed to the savings in the costly space occupied by computer laboratories which could be achieved if each student had a laptop computer. Not only would the student require a workspace of only four square metres, but distributed network connections could be provided across the campus and possibly wireless connections as a development of digital mobile phone technology.

Dr. Grace Kenny, consultant to the OECD, from the United Kingdom, introduced the topic "The Blurring of Boundaries between the Sectors of Education and the Impact on Facilities Management". The attempt to make the best use of assets by extending the range of users and providers was pointed to as creating a number of tensions. These included differing user expectations and functional requirements, clashes of culture and diseconomies of scale. Some responses to these tensions were to maximise the adaptability and flexibility of designs and to pursue partnerships or federations of institutions instead of mergers and to find better ways of achieving co-operation between the public and private sectors.

William A. Daigneau, Associate Vice-President and Chief Facilities Officer of the MD Anderson Cancer Center of the University of Texas, United States, introduced the topic "The Impact of Student-centred Funding on Facilities Management". The accelerating trend for students to have to bear the cost of their education was highlighted. As a consequence, the demographics-based campus planning of the past would have to shift towards a market-based planning



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model as students "vote with their feet" demanding facilities to meet their needs as consumers, such as food courts, recreational facilities, health clubs and student residential accommodation.

Professor Denise Bradley, Vice-Chancellor of the University of South Australia, addressed the topic "The Impact of Student-centred Learning on Facilities Planning". It was pointed out that planning would need to take account of student cultural issues and preferred learning styles, and recognise that in Australia, in excess of 50% of undergraduates are mature age students.

Student interactivity in small groups may in some instances be provided by way of "virtual" small groups instead of actual ones, and the need for large lecture theatres would diminish through the use of technology for alternative means of educational delivery.

The student not the teacher was now seen to be at the centre of the educational transaction. Facilities planning would therefore be driven first by students, but academics would still play an influential role.

Nigel French, Secretary-General of the University Grants Committee of Hong Kong, China, addressed the topic "Space and Accommodation Needs and the Development of Planning Standards". A case study of the Hong Kong university system was presented, outlining the recent rapid expansion in student numbers and associated extensive building programme as the rationale for carrying out a major review of space utilisation and planning norms across the entire system.

### Working group themes

#### *The impact of information technology on facilities planning*

All working groups concluded that in the future, information technology (IT) could be expected to be funded at the expense of facilities. It was questioned whether IT would reduce space requirements or building costs. Although there would be no standard space model, users would need to be trained to use space more efficiently. There would be a need both for flexible teaching spaces and for adaptable space which could be changed to accommodate the needs of an unpredictable future.

Existing lecture theatres may become inappropriate with the growth of IT and as an increasing focus on creating "learner-centred" environments emerges. Computer modelling is replacing the need for wet laboratories, reducing the number required and the need for costly laboratory upgrades.

The need to align facilities to student needs would become more dynamic as students move freely between institutions and as discipline loads are less predictable. Amenity and image would be of increasing importance to attract students to a particular campus.

Overall it was expected that there would be a considerable impact on the total facilities footprint in institutions, as budget demands move to IT investment. Many functions would move off campus, such as production facilities for distance education. Opportunities for partnering with outside organisations would be explored, such as external sponsorship of IT, external funding of new or refurbished building stock and the leasing of surplus space on campus to suitable tenants.

#### *Global information networks*

This working group concluded that global information networks would support greater diversity of access and lead to greater specialisation amongst tertiary institutions. There will be funding pressures to decrease the number of research universities and there will be both more strategic alliances to better meet clients' needs, and opportunities for institutions to franchise their products more easily.

#### *The physical environment for tertiary education in the year* 2010

This theme was introduced by Professor Denise Bradley, Vice-Chancellor of the University of South Australia, in her paper "Aligning the Physical Environment to Educational Objectives".

The paper pointed to the need as we enter the 21st century to balance the ideas of a "virtual university", the meaning of a university education as communicated by where its campuses are located and the university as a community of scholars.

In 2010 students will be both on campus and linked from home, the workplace or overseas by high speed, low cost communications connections. Students will access university services and premises 24 hours per day, seven days per week. University buildings will be small and functional and will house people engaged in direct student support in person and on-line. Administrative, technical and academic services will be provided by specialist businesses outside the university.

Research and research training will largely be undertaken by university staff and students off campus in research centres where the university, government, other universities and industry are equal partners.

Universities will be involved in dozens of alliances to provide teaching and research, with other universities, multinational corporations and other education providers.

The campus will remain at the heart of the university as more of a point of reference and connection with traditions, rather than a place where all students and staff gather regularly.

The working groups, in addressing this topic, concluded that technology would provide added choices to students without necessarily superseding existing choices. Whatever form the physical environment takes in the future, there will be a need for institutions to ensure that their offerings are quality assured, as individual students are required to meet an increased share of the cost of their courses from their own resources.

The 21st century tertiary facility will need to better recognise the full cost of land and buildings occupied solely by the facility. This recognition will lead to solutions to their requirements which make greater use of existing infrastructure, both public and private, or to joint-venturing with other organisations to lessen the demand for investment capital.

The facility will have the capability to operate 24 hours per day, seven days per week, 52 weeks per year. It will make greater use of community space and will therefore rely less on the current model of sole occupancy of specialised facilities. It will have communications and organisational links to outside bodies and more of its administrative systems will be outsourced.

## Asset management today and the changing role of the facilities manager – four perspectives

### *"Asset Management: Today's Best Practice"*

This paper was presented by David Rowland, General Manager of Properties of the New South Wales Department of Education and Training. The paper described the sophisticated management regime adopted by the Department to manage its property assets which comprise schools and colleges valued at approximately 15 billion Australian dollars. It outlined the Department's Asset Management Systems project and the improved maintenance and facilities management capabilities which it had developed, together with the use of advanced technology. This included the move from cyclic to condition-based maintenance, the establishment of school facilities maintenance standards and the use of hand-held computer technology to assist in recording details of building conditions.

The new system was driven by the underlying principle of the New South Wales Government's Total Asset Management strategy within the framework of which each department is required to operate. This principle changes the emphasis from asset creation to asset utilisation based on service delivery. It addresses the issues of asset acquisition, maintenance, operation, enhancement, decommissioning and disposal.

The new system was implemented in the context of the introduction of accrual accounting to government and the consequent requirement for reporting on extensive asset information. At the same time, a departmental restructuring took place, which centralised the control over properties, previously the responsibility of ten separate regions.

The Department has now made the move from capital investment for asset creation to the management of assets for whole of life and a system-wide view. The data now available makes known the current condition of every building in the asset base together with the resources required to maintain the buildings to the appropriate standard.

### *"Management of Swedish University Premises"*

This paper was presented by Hans Antonsson, Managing Director of *Akademiska Hus i Umea* AB.

In the paper it was explained how all university buildings in Sweden have been state owned since 1830. In 1993 *Akademiska Hus* AB was formed as a state owned company and all university property was transferred to it from the National Board of Public Buildings.

With a property portfolio of A$ 3 206 million, the company has eight subsidiary companies in the seven university cities in Sweden. The parent company is in charge of the overall management of the group and is also responsible for the finances within the entire group. The subsidiary companies' functions concentrate on direct contact with the universities and on building, running and maintaining the estates.

The company leases buildings to all the universities, but premises may also be rented from private organisations in direct competition with it. This is the choice of some of the smaller university colleges where the scale of operation is such that it makes it difficult for *Akademiska Hus* to offer an arrangement which is competitive with local private organisations.

Competition has as a consequence kept university rental and facilities management costs in Sweden contained, as has more effective management put in place by *Akademiska Hus*.

### "*Review of Space and Accommodation Needs in Hong Kong's Universities and the Development of New Planning Standards*"

This paper was presented by Nigel French, Secretary-General of the University Grants Committee (UGC) of Hong Kong, China. It described the background to a review of the space and accommodation needs of the eight higher education institutions for which the UGC has funding responsibility. Following a period of dramatic growth in the publicly funded higher education sector and faced with changes in the teaching and research environment, the UGC is seeking to develop new planning standards for the assessment of future capital-works project proposals from these institutions.

The UGC held doubts about whether the continued application of the United Kingdom's space norms (established by the UK University Grants Committee and the Department of Education in the 1960s and 1970s) still reflected current space use and needs for higher education. Doubts were also held about whether space utilisation surveys undertaken earlier were sufficiently accurate and representative.

A Working Group on Space and Accommodation was established to review these issues of space use and planning norms. It recommended the appointment of expert consultants to undertake a focused study to develop a methodology and carry out an assessment of the adequacy of the UGC-funded institutions' current and approved space and accommodation to meet levels of activity. Accordingly this consultancy was approved and was proceeding at the time this paper was presented.

### "*The Changing Role of the Facilities Manager*"

This paper was presented by William Daigneau of the University of Texas. It explored the question of trying to predict the future of higher education in order to determine the role of facility managers and the necessary skills they would need in order to prepare for and shape the future. The process of scenario planning was discussed as undertaken by a group of members of APPA (The Association of Higher Education Facilities Officers in the United States). The central forces shaping the future were identified as information technology, resource scarcity, societal change, the role of government and environmental deterioration.

The scenarios that were developed in the context of these forces identified some important roles that the professional facilities executive could or must play to improve higher education in the future. These leadership roles encompassed the following areas:

- operational effectiveness – improved efficiency and cost effectiveness;
- strategy – improved facilities management strategic decision-making;
- partnering – more innovative structuring of new business arrangements with industry;
- asset management – more strategic management of capital assets with an emphasis on financial analysis, real-estate knowledge, property management, capital budgeting and an understanding of capital sources and uses;
- information technology – a working knowledge of the technology and its application will be an increasingly important requirement in order for facilities managers to help make decisions in respect of the design of facilities such as workstations and learning centres and the capacity and configuration of cabling and associated infrastructure;
- leadership – to lead the institution in the solution of these issues, facilities managers must develop, as well as their specialised professional expertise, the skills and abilities of the executive decision-maker.

William Daigneau closed his presentation by sharing a personal axiom: "Success will be determined not by our ability to plan for change, but by our ability to change our plans."

*Chapter 1*

# ADAPTING TO A CHANGING ENVIRONMENT

# ALIGNING THE PHYSICAL ENVIRONMENT WITH EDUCATIONAL OBJECTIVES

*by*

*Professor Denise Bradley* AO
Vice-Chancellor
University of South Australia

Both serious academic writers and the popular media presently spend considerable time exploring the impact of new technologies on education. One of the conclusions frequently reached, by both sets of commentators, is that universities as we know them – bricks (or sandstone) and mortar – are things of the past, soon to be overtaken by "the virtual university".

## UNIVERSITIES: VIRTUAL SPACE OR COMMUNITY?

A counter view to this is worth attention. In *Australia's Future Universities* (1997), Dennis Gibson, Vice-Chancellor of Queensland University of Technology (QUT) writes, among other things, about the physical environment of universities. He notes it has been suggested that the physical environment will become less and less important in the face of advances in information and communications technologies. Yet, he rightly points out that physical location is still a significant factor in student (and to some extent staff) choice between institutions. It is not just a matter of location but what he calls a "sense of place" with its "symbolic connotations".

Professor Gibson speaks of the important semiotic "message" conveyed by the central city location of QUT's Gardens Point Campus. It is a message which the University of South Australia similarly sends with its recent accommodation of the Faculty of Business and Management in the Adelaide central business district at its new City West Campus; or, indeed, the long standing location of the University's science, engineering and information technology faculties at The Levels Campus, with the synergies this enables between the University and research and development organisations at the adjacent Technology Park. The same is true for the well established Health Sciences "precinct" at the University of South Australia's City East Campus, with its connections to the Institute of Medical and Veterinary Science, the Royal Adelaide Hospital and the University of Adelaide Medical and Dentistry Schools.

As these examples demonstrate, modern universities are striving to make courses relevant to students' likely careers, by establishing strong physical links between where students study and where their future professions are practised. Nevertheless, the old notion of a university removed from the world, "sequestered from the pressures of everyday life" – the image of "dreaming spires" – remains romantically present. It is interesting to see how many Australian universities which are most modern, vocational and aggressive in their marketing, build that marketing around images of 19th century stone quadrangles and cloisters. Because, even in a knowledge-based society at the beginning of a new millennium, these images sell "a university education".

Alan Gilbert, Vice-Chancellor of the University of Melbourne, added a further spin to this discussion when he said that universities may well become "virtual universities – only without relinquishing the educational value-adding they have always sought through the maintenance of real, informal, learning communities" (Gilbert in Maslen, 1996, quoted in Sharpham and Harman, 1997).

How can all these things be balanced – the virtual university, popular views about the meaning of a university education as communicated through the location of its campuses and how they look, and the



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university as a community of scholars – at the dawning of the 21st century? This discussion begins with some of the assumptions implicit in how universities are organised.

## THE PAST AND PRESENT ASSUMPTIONS

The assumptions which underpin educational delivery in universities are so fundamental that they are often unexplored and unchallenged. The assumptions which have dominated Western approaches to higher education include the following:

- the disciplines of knowledge are best served by intellectuals gathering together in communities;
- transfer of knowledge and understanding across the generations involves young people gathering at those communities to attend on the discipline experts, often by residing within the community or nearby;
- for efficiency, it is best for information to be transmitted from the discipline experts to students in groups, typically in large lecture halls, although this has never really been regarded as the ideal;
- education is essentially about the transfer of information from teacher to student where expertise is solely located within the teacher who provides best recourse to information, ideas and interrogation of the content for the student;
- assessment of learning is best undertaken at the end of a course of study, as an examination, taken by all students simultaneously in the same place under the same strictly supervised conditions;
- for this form of educational provision to be effective, all other sources of information must be co-located with the community of scholars, primarily in libraries.

Research and scholarship in universities also have powerful underlying assumptions. Many are now under active challenge. The older assumptions were that research is:

- a core activity of each academic;
- an individual, curiosity driven activity rather than a group activity;
- an activity separate from national or industry concerns.

Finally, it was also assumed that the education of new researchers occurs in a close and essentially private relationship with a single senior researcher as supervisor.

## EMERGING ASSUMPTIONS

Some underlying assumptions about teaching and learning are now being challenged by the concepts of student-centred and lifelong learning.

The concepts of student-centred and lifelong learning:

- value openness, by which is meant the determined attempt to provide students with significant opportunities to exercise choice and assume responsibility for managing their own learning;
- assume that much education will be highly individualised, that the particular student will exercise control over what, how and when study occurs for him or herself;
- recognise that new forms of technology allow both students and teachers to identify, locate, recover and store information in ways which are both quantitatively greater and qualitatively different from before;
- acknowledge that learning is not simply the transmission of new skills and understandings to neophytes, but frequently involves mature and experienced learners reflecting on, and critically engaging with, new interpretations of the theory and practice which shape their day to day professional work;
- expect that professionals will enter formal education again and again through their working lives and will mix this with other forms of informal and non-formal learning;
- recognise that formal study is only one of a number of responsibilities students concurrently bear and has to be accommodated in ways which acknowledge those other responsibilities;
- acknowledge that there is a substantial and growing experience in Australia and other countries of alternative forms of delivery which, however they mimic the assumptions of the past, do not rely on the face to face contact in single physical settings which so characterises conventional on-campus education.

These concepts have gained new power and currency very recently as the development of the

Internet and the World Wide Web make it possible for any diligent student, anywhere, to have as great a knowledge of some aspect of the course in which they are enrolled as the person formally charged with delivering the subject. This is the first technology since printing which has the potential to revolutionise higher education teaching by its capacity to remove the teacher's monopoly of content knowledge and by opening universities to global competition for the provision of educational services.

Assumptions about research are also undergoing change. More recently they are that research will be:

- one of the responsibilities of most academics but that other forms of scholarship may dominate for some;
- conducted in groups or coalitions of academics organised around a particular theme or emphasis;
- organised in groups supported selectively on performance in each university;
- conducted in partnership with industry and in harmony with national directions.

The education of new generations of researchers has also changed. First their numbers have increased enormously and, second, research training is a more public affair. Research students now usually have two supervisors, with strong, public and regular monitoring of student progress and with the supervisors required to satisfy explicit institutional codes of good practice. In many Australian universities at present there is considerable controversy surrounding these changing assumptions about research and research training. The most powerful members of the academic communities – senior researchers – have strong views about the emerging framework for research in Australian universities.

## TECHNOLOGY AS THE DRIVING FORCE OF TEACHING

Tony Bates, from the University of British Columbia and formerly of the Open University of the United Kingdom, advocates the benefits of increased use of information and communications technologies in university teaching. Technology can:

- increase access;
- improve quality;
- reduce costs;
- improve cost-effectiveness.

Dependence on information and communications technologies requires changes to how infrastructure is funded and, more significantly, what infrastructure is funded. Substantial expenditure is necessary to develop the required infrastructure: high speed networks linking every building, and within every building, every classroom and office. Old buildings do not have adequate conduits for the necessary wiring, or have asbestos infills in walls which have to be removed before cabling can be installed. Multi-campus institutions such as the University of South Australia have additional problems in needing to provide video links and electronic networks between campuses, as well as the general need to ensure Internet connections of sufficient speed with the world outside the university and sufficient numbers of ports and communications facilities to enable off-campus students to access on-campus resources. Bates warns it is essential that the university's infrastructure plan, including that for its technology infrastructure, be driven by, not lead, the institution's teaching and learning strategy.

## WHAT KINDS OF BUILDINGS DO MODERN UNIVERSITIES NEED?

Given all that, what sort of institutions should one be looking to? How do people start to adapt the huge stocks of buildings to the new requirements? How much of what exists must change? What is essential in new buildings as they are planned and constructed?

### Educational delivery – shared with whom?

The new technologies have great implications for the relationship between teacher and learner. On the one hand, they allow a form of individual interactive contact which is different from that of the immediate past with its large lectures and associated tutorials and seminars. However, potentially they introduce into the relationship other parties – for example, the instructional designer, the on-line editor and the other academic members of the subject development team. These people may or may not be located on campus, or be members of the university. The teacher, too, may be teaching using on-line materials purchased from another university or be a member of another university contracted to teach this subject.



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**Lecture theatres – how many, what size, for what purpose?**

The need for large group teaching spaces is certainly diminished by video on demand, on-line teaching materials and the vast information resources available through the Internet. However, the need for and cost of the necessary staff development for academic staff to realise these opportunities will slow uptake.

**Provision for going on-line – where, how many entry points?**

The capacity of the new technologies to modify more conventional forms of on-campus delivery is clear, so one must consider, when groups are brought together, what facilities will be required for accessing a range of on-line services.

**Office space – how many, what size?**

Academic staff will increasingly work from home, becoming more accessible to their students via electronic forms of communication. This means one needs to look again at the physical facilities available for academic staff on campus. Thames Valley University in the United Kingdom moved all academic staff to an open plan office block near its main campus. All space on the campus has been given over to student services and teaching accommodation.

**Administrative support – how many offices, what kind?**

Information technology is revolutionising service provision within universities. For example, electronic communication dominates administrative processes in all universities and major changes are occurring in skill profiles in administrative units. Demand from students for 24-hour support and for access to a "one-stop shop" is shaping how the university's administration is organised.

**Equipment – how much, how fixed?**

Provision of space for equipment is a difficult issue. For example, the University of South Australia's campus at The Levels, like many science and engineering buildings, is a monument to the past. Built at great expense in the early 1970s it housed then some of the most modern facilities for teaching science and engineering in the country. There are vast laboratories filled with large machines that no one uses and which have been superseded by smaller, flexible computers. (Also, it had almost no women's toilets.) It enshrines the assumptions of the period about the equipment used in industry but was not designed for easy or cheap conversion as that equipment became obsolete.

**Libraries – print or data delivery?**

Since resource-based learning is an essential component of both lifelong and student-centred learning, resource collections accessible to students are still needed. However, with advances in technologies, library collections may require fewer rows of bookshelves and more electronic access points. (At present they are requiring both more bookshelves and more access points.)

**Individual or group space – where on campus?**

Much greater emphasis has to be placed on spaces for individual students, and small groups of students with like interests, to work quietly on-line, supported by a great range of services which can all be accessed by computer. There are issues, of course, about supervision, about who provides the computers and about who services them.

**Forms of group space – to support what activities?**

Conversely, there will have to be spaces for on-campus students to engage vigorously with each other, but without the confines of the typical classroom or intervention of a teacher. Forms of delivery like problem-based learning need teaching spaces that comfortably accommodate groups of 20 to 30 with immediately adjacent and soundproofed smaller breakout rooms to enable small groups to engage in the often heated discussions necessary for this form of learning.

**Partnerships with other institutions and with industry – how are they managed?**

The concept of lifelong learning already brings the university into partnership with other educational providers in vocational education and training, with other universities in consortia like the Open Learning Agency and with industry as in the activities of Deakin Australia. This means consideration of universities leasing space to their partners or leasing space from partners.

**Research facilities – where, for whom and to do what?**

The nature of research in universities is changing. Research funds are being directed to research



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concentrations and universities are moving to "pick winners" – to select areas and groups which can be supported. The implications for the disposition of campuses and for disposition of space within campuses are considerable. For research which employs large and expensive equipment, 24-hour access for a range of users, including industry partners, is essential.

**Clinical and industry placements – implications for space?**

These form an essential component of most professional degrees and are still conducted on campus. The learning environment must provide opportunities for either actual workplace practice or for simulations, both of which have significant implications for asset management: the first in terms of extensive block student absence from the campus, the second in creating appropriate laboratory and simulation facilities.

**Practical work – what requirements?**

In areas such as the sciences, with laboratory work, or art and architecture which teach with a studio-based model, there is a need for exclusive access to teaching and learning spaces to enable work-in-progress to continue over substantial periods of time. As well, provision must be made for after hours and weekend access for students, often unsupervised by staff. This, of course, cuts down any flexibility in timetabling and can provide a real challenge for computerised systems.

The pressures to design universities with buildings which will serve the many, and often conflicting, demands of the present as well as position universities for the future are very great. Concepts of the purposes of universities may be relatively unchanging but, in practice, institutions are very different even now, from what they were ten years ago. By 2010 great changes in teaching delivery and research will be in place but, even so, it is likely that some activities will remain campus-based – the challenge is to foresee which they are.

## CAMPUS CULTURE

The matter of the campus community or the campus culture deserves more discussion because that, too, is changing. So many of today's students work full- or part-time in addition to studying, so many are of mature age when they study, so many have other pressures and responsibilities in their lives that campus life does not provide the major focus for their social interaction as once it might and this, in itself, has implications for the physical environment of the university. How can the campuses be kept alive if students are accessing their courses from home or are transients – arriving only for the period of face to face contact with the teacher?

Among ways in which universities are attempting to accommodate these changes in student activity patterns are in the hours they stay open for both teaching and administrative functions, and in the wider accessibility they offer to resources and buildings. Issues of parking, transport, lighting, safety and security are now important concerns for all asset managers.

Care must also be given to how to enhance campus culture in what is an increasingly diverse and multicultural environment. The University of South Australia has done this by a determined decision to become more customer oriented – to find out what students actually do on campus and to provide services, including culturally appropriate services, accordingly. For example, 24-hour campus computer pools have been consolidated so that they are all located near one another, making access more convenient for students and enhancing safety by there being larger groups of people in one area after hours. Other student services are also located in as close proximity to the computer pools as is possible. This means that there is a gradual move towards the provision of a "one-stop shop" on each campus for non-curriculum related student services, such as women's rooms, prayer rooms and kitchens, with obvious benefits both for students in convenience and safety and for the organisation in terms of staff and space allocation.

Increasing the link between the university and the community is a further means of enhancing the quality of campus culture and, indeed, of student learning. For example, a new government sponsored residential development, Mawson Lakes, is being built alongside the University of South Australia's campus at The Levels. The University is involved in an exciting collaboration with the developers and government in exploring ways to share services across both the development and the University.

## THE UNIVERSITY OF 2010

Looking back over the last thirty years one can see that there have been dramatic changes in the requirements of the physical environment to



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accommodate the explosion in student numbers, the changes in approaches to teaching and learning, introduction of new technologies and new frameworks for conducting research. Many new university buildings, indeed new universities, have been built in this period. Many of them, as suggested above, show remarkable similarities to universities of a much earlier age.

What is clear about the future is that universities will continue to confront considerable change – in funding, in student demand, in teaching and learning practices and in their relationships with the wider community. Such changes will impact on the physical environment. Although there will still be a need for buildings and campuses, technology will undoubtedly play an increasingly important role in teaching and learning. It is necessary to prepare for this both by changing building design and, more radically, challenging the need for buildings.

What will the modern university of 2010 be like? Students will be both on campus and linked into the campus from next door or overseas, from home or the workplace, by high speed, low cost communications links. Where they access university services or premises they will use forms of electronic identification which allow 24-hour, seven-day-a-week access. More importantly, though, this will allow collection of important information about patterns of demand and use.

Students will receive lively and well constructed presentations of core course content from lecturers in their own university or elsewhere, have access to library catalogues and parts of library collections, be connected to other students on-line for a wide range of formal and informal learning and social activities, and search the full range of information resources available through the Internet. Lecturers will attend the campus once or twice a week for face to face meetings with colleagues and students, working at home for the remainder of the time, but in constant contact with students and colleagues, individually or in groups, by phone and electronic means. University buildings, small and functional, will house people engaged in direct student support in person and on-line, because, increasingly, services – administrative, technical and academic – will be provided by businesses outside the university which specialise in these areas. Research and research training will largely be undertaken by university staff and students off campus in research centres where the university, government, other universities and industry are equal partners.

The university library will be transformed. It will be a node in a national or perhaps international library consortium. Most of its material will be available on-line and, where the book or journal is required, this will be delivered from a central deposit point. Computer pools will have disappeared. Each student will have his or her own access device which can be plugged in anywhere to allow access to the university's resources. Universities will be involved in dozens of alliances to provide teaching and research. They will teach courses at all levels with other universities, with multinational corporations and with other education providers. They will conduct research too with a range of partners.

Although there may still be a campus at the heart of a university this is more likely to be a point of reference, of connection with traditions, than a point where all students and staff gather regularly. Universities as places of learning will survive but they will look very different from the way they look now.

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# SOME CHALLENGES CONFRONTING HIGHER EDUCATION

*by*

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Observers of higher education would be struck by the similarities of the challenges facing universities across the Western world. Put briefly, these include the following:

- While governments recognise that higher levels of education are needed for the so-called "Knowledge Age" of the next millennium and are comfortable with supporting the notion of universal access to tertiary education, demographic factors and the economic consequences of globalisation are likely to result in health and welfare spending occupying an ever greater share of public outlays.
- Universities are increasingly being seen as one part of a spectrum of tertiary education. Structural and attitudinal barriers between institutions and across sectors are expected to weaken.
- While in some countries public spending on higher education has increased, government funding has declined on a per student basis.
- Students are bearing an increasing share of the cost of their education, which is increasing pressures on those with less capacity to pay, or have fees paid on their behalf by employers or family.
- Universities are facing demands for greater productivity and efficiency from government, demands for greater relevance from employers and demands for higher standards of education and service from students.
- Universities need to diversify their income base and develop distinctive roles for themselves in the national and international educational marketplace.
- Governments are increasingly anticipating that capital investment in the form of bricks and mortar will be superseded by technology-based virtual delivery.
- Library and research resources need to be rationed among and within universities in the face of natural academic tendencies for expansion of disciplines and formal institutional expectations of research performance from academics.
- The role of academic staff is undergoing "vertical disintegration", that is, the various components of teaching, research, administration and service are increasingly becoming separated and specialised, and contributed to by non-academic staff.
- Traditional academic methods of governance, decision-making and employment practices are coming into conflict with the above pressures.

Some university leaders are reluctant to use the word "crisis" to describe the situation facing higher education institutions and, perhaps for some, the diagnosis is more chronic than acute. However it is evident that there is widespread unease both within and outside universities about their capacity to fulfil their own internal expectations as well as to meet the needs of individuals and the community.

The report of the West Committee[2] made much of the potential for universities to use their physical assets in a more businesslike manner. It also backed the idea that careful deployment of information



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technology could reduce the costs of administrative and management systems, although it recognised that such internal re-engineering was inherently a risky endeavour.

However the West report paid far less attention to the management of universities' most important assets, their staff. This linguistic incorrectness is not to imply that people are indistinguishable from buildings or machines and only to be considered as resources to be managed or consumed for the greater good of the enterprise. Indeed, the point is that the West report's discussion of staffing issues falls short for precisely this reason.

The report noted that university balance sheets do not value land and buildings at market value and, as a consequence, financial decisions concerning the use of property are skewed. While recognising the complexities of what it proposed, the report suggested that universities be given greater freedom to manage their capital resources, thus enabling them to leverage their assets to help finance necessary changes and to manage their activities efficiently and effectively. In its only significant reference to staffing issues, the West report adopted a similar approach. Noting that universities are expected to work within a more deregulated industrial relations framework, the report recognised their limited flexibility to influence their income streams. That is, the capacity of universities to alter their income through fees is limited. The report's solution was, of course, to recommend that universities be given greater flexibility by being allowed to charge fees for all their activities.

A hundred years ago, Australian universities typically comprised a set of tenured professors, supported by lecturers, assistant lecturers and demonstrators. In the early part of the 20th century as funding became more scarce, there was pressure to appoint cheaper grades of teaching staff on a short-term basis. At the University of Sydney, professors declined in relative numbers from around half of all full-time staff in 1900 to around one quarter by 1919.

Until the 1960s, academic autonomy and authority were enshrined in the German model of a traditional department with a single professorial head. Universities were run on the basis of informal relationships between the professors and central administration, an arrangement which worked as long as departments were few and the interactions of the external, political and economic relationships of the university and its internal academic affairs were simple. The real work was seen to take place in the departments; central administration was a secondary function which, in the words of a former senior academic manager from the University of Melbourne, was properly carried out by the vice-chancellor, the registrar, some interested professors on a part-time basis and some submissive clerks of various grades.

The post-war growth period created a strong demand for university staff. Job opportunities within the university system and the education sector in general were relatively plentiful for university graduates. The Martin Committee noted that staff numbers had grown by 350% over the previous decade, and it forecast that this growth would need to continue for at least another decade. However, the new environment of mass higher education required more than a uniform increase in the volume of staff. In the 1960s a different set of pressures led to an expansion in cheaper forms of teaching staff, notably in the form of postgraduate tutors.

Change continued as enrolments grew and research perspectives came to dominate. Teaching became more the responsibility of the lower status grades of lecturer and tutor. Academics are supposed to undertake both teaching and research, and Australian universities are in part funded on that basis. However there is great variability in the mix of these activities: some academics undertake very little research while some are engaged on a research-only basis. Indeed it should be expected that the mix should vary to reflect individual expertise and inclination and should also vary over time. Yet such flexibility is often not reflected in staffing policies and practices.

In more recent times, a resurgence of interest in innovative teaching and learning has continued the shift from viewing teaching as the responsibility of a single academic to a growing realisation that effectiveness requires a team-based approach that must involve non-academic staff. As private providers of higher education have emerged, particularly in the United States, working models of new approaches have been demonstrated – models which "unbundle" the process of designing, marketing and delivering education. The exemplar is the Apollo Group, whose University of Phoenix turns conventional university organisation on its head. The core of the university is its permanent general staff, responsible for management, marketing and administration, while the academic function, which involves teaching only and no research, is outsourced.

This may not be a model to which Australian universities should aspire, but it does illustrate the potential for what has been termed "vertical disintegration". A list of the various activities involved in university education might be compiled of the following:

- marketing courses and administering applications;
- assessing students' credentials and giving credit for entry;
- designing and co-ordinating units and courses of study;
- designing and developing resources used in learning; these might include textbooks, videos and computer packages;
- assessing resources for quality;
- navigating and advising students through choices of study options;
- delivering instruction, for example by lecturing or demonstrating practical work in laboratories;
- ensuring provision of suitable infrastructure, including library and computing support;
- acting as guide and mentor to students either singly or in groups;
- assessing, evaluating and providing feedback on student progress;
- certifying completion of award programmes.

Already these tasks are undertaken by a mix of general and academic staff, and by a mix of full-time, part-time and casual staff. As cost and demand pressures escalate, these components will require ever greater co-ordination. Yet traditionally universities have acted as if there was a neat divide between academic and non-academic functions. At the Queensland University of Technology, for example, the student administration department has only recently been brought into the committee responsible for developing university policy on teaching and learning. In seeking to improve the flexibility and responsiveness of academic programmes, one must also ensure that administrative systems, which have been designed for fixed semesters and entry dates, are able to cope.

The intersection of academic and administrative matters also becomes apparent in relation to the resourcing of information systems. Recent falls in the Australian dollar have served to accelerate a process that has been in train for some time, namely, the squeezing of library resources. In large part this is driven by the escalating costs of academic journals, against which the purchase of student texts must compete. At the same time the demand for computing is rising dramatically, in teaching, research and administration. In many cases these resources are provided centrally, and so competing pressures must be resolved through negotiation between academic units and the university centre and between academic and non-academic staff.

These trends represent more than just a need to improve co-ordination among the various groups within the university. Roles are becoming blurred as non-academic staff become involved in academic activity, and as academics take on administrative and management functions. Greater interaction with the workplace, for example, has led to an increase in the numbers of adjunct and part-time staff for whom traditional academic pathways are not necessarily relevant.

As universities have grown, they have needed to develop more centralised functions to co-ordinate activity across departments, schools and faculties, and to promote the development of institutional activities such as research, teaching and fund-raising. These functions have usually been headed by senior academic staff who take on management responsibilities, sometimes to the exclusion of academic work. The rise of the so-called "Vice Squad" of pro-vice-chancellors and deputy vice-chancellors with specific programme responsibilities has been remarkable. By mid-1997 there were more than 130 such officers across 37 Australian universities.

Responsiveness to outside demands, particularly from governments, has necessitated a greater degree of executive decision-making and management by non-academic staff. It is not uncommon to hear complaints from academics about what they see as unwarranted intrusion into their affairs by non-academic staff from finance departments, research offices or personnel areas, when in fact such staff are ensuring that activities are being carried out in accordance with legislative or university requirements.

The net effect of all these changes is that university staffing policies and practices need to take into account the increasingly important roles played by staff other than full-time academics. All too easily, non-academic staff and academics employed on a part-time or casual basis can feel alienated and undervalued by an institution. This is particularly the case when university structures and policies mean



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that decisions which affect the whole university are taken by full-time academic staff alone, and where such staff receive priority for professional development and training.

This paper opened with a listing of some of the major challenges which are confronting higher education. These are the familiar "A list" issues that recur whenever contemporary higher education is discussed. To close, a "B list" of issues is added here that are perhaps very relevant to the immediate concerns of universities:

- A very significant proportion of Australian graduating students are unhappy with their experience at university.
- Not all academics are all-rounders, and the teaching-research nexus is already very significantly broken at the individual level. It also is unrealistic for many universities to be comprehensive in scope.
- At Australian universities, much of the teaching and its support is being undertaken by a large underclass of academic and support staff for whom the systems have traditionally not catered.
- Universities need to adapt the ways they deliver material and assess student work to an environment where students (both school-leavers and those at home or in the workplace) have greater access to and familiarity with diverse sources of information.
- Universities have yet to absorb the extent of the income gap they face.
- Much decision-making is still representational.
- The performance improvement agenda has, to date, been waged at the institutional level. In dealing with that agenda one must learn to link people to the organisation.
- The focus of government is shifting as it moves to be a purchaser, rather than a patron, of education.



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# THE CHANGING ROLE OF THE FACILITIES MANAGER

*by*

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## WHAT IS THE FUTURE?

What is the future of higher education? What role will facilities managers play in responding to, or perhaps helping shape, that future? What skills and talents will be required of facilities managers to play that role? What should facilities managers be doing to help higher education prepare for the future?

When trying to predict the future of facilities management one is forced to examine the core industry that it is inextricably tied to: higher education. Given that the future of higher education will determine to a large extent the future of facilities management, one could conclude that if higher education continues to prosper, the future of facilities management will also be quite prosperous; or if for some reason higher education declines, then the role and purpose of facilities management will also decline. This relationship would appear to be self evident; but when a group of American facilities managers tried to look into the future, it did not find this to be necessarily true.

Why? Because the shape of the future higher education enterprise could evolve into something much different than its traditional structure, using methods of delivering education and knowledge which may or may not depend on the types of facilities it has relied on in the past. Such a fundamental shift in educational delivery, as well as the role of higher education itself, would inevitably alter the need for its support systems and management requirements. This in turn would drive fundamental change in the need for facilities, their size, type and location, how they are managed and the role of the facilities manager. Such changes, should they occur, would create a set of additional questions: What should be done today, in the management of facilities, which would allow higher educational institutions to pursue and accommodate such changes? What should higher education's professional facilities managers be doing to prepare for these changed management needs and perhaps a new role for them in higher education?

The genesis of such questions began when APPA (The Association of Higher Education Facilities Officers) attempted to chart the future of higher education facilities management. To deal with this challenge, a group of senior facilities executives, facilities managers, consultants, association leaders and industry representatives were assembled in a retreat setting to discuss the following:

- What will the future be like for higher education?
- What forces will drive higher education in the next decade?
- What are the most critical forces?
- What are some possible future scenarios which institutions will most likely face?
- What strategies can be employed to contend with these scenarios?
- What role should the facilities manager play in shaping these strategies?
- The group undertook a "scenario planning" exercise to help address these questions.

## SCENARIO PLANNING: THE METHOD

Scenario Planning techniques start from the simple premise that while change is certain, the form of that change is uncertain. Therefore, trying to predict



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the future is futile. Instead, one is better off trying to understand the forces that will shape the future and to then create "stories" or scenarios of how these forces might combine and what the resulting future might look like. Using this technique, the APPA group proceeded to identify over 160 forces that will, or are likely to, affect the future. These forces were categorised into five major groups and then rated on the level of certainty that the factor would affect the future as envisioned. This list was then prioritised as to which forces would have a significant impact on the future, especially as they would influence higher education. Certain primary themes emerged as the group identified the critical factors. Briefly, the central forces shaping the future were the following.

**Information Technology** – Even with the dramatic advances in information technology made over the past decade, some prognosticators have said this is only the dawn of the information age. The group identified information technology as having a great impact on educational delivery, and a greater impact is also highly probable to occur.

**Resource Scarcity** – The group concluded that the competition for resources to support all of society's needs would continue to be a major force in the future. Education at all levels will most likely be a high priority as it has in the past, but the public's demand that resources be used effectively and efficiently would most likely be a major factor. In addition, the emergence of a global economy, changes in historical business cycles, shifts in the distribution of wealth and market reactions to ever increasing consumerism would most likely drive all segments of service providers to prove the value of their products.

**Societal Changes** – In America there is constant discussion of the changes in society that have and continue to occur. Increased immigration, the effects of the baby boom generation, changes in traditional family structures and the increasing frustration and anger evident in society are major forces which will affect the future.

**Role of Government** – The societal changes noted above will in turn affect the role that government plays in the future. The group felt that government will be expected to shepherd the public's tax dollars in a way which maximises society's expectations and needs. The public's demand for accountability will also pressure greater governmental oversight in the use of tax dollars.

**Environmental Deterioration** – A growing global population will continue to stress the earth's natural resources, the group decided. This will lead to continuing depletion of energy resources in all forms, increasing air and water pollution and ever increasing demand for products derived from forest, agricultural and mineral resources. Such forces will in turn affect the other forces identified above, primarily governmental control, resource availability and distribution, and societal needs.

The direction and degree of change in each of these major forces were thought by the group to be primary determinants of the future. Likewise, higher education's response to these forces would also determine its future. The power of scenario planning is that it is not necessary to make assumptions about future direction or magnitude. Instead, it is only necessary to create stories about how these factors might combine in order to identify the possible outcomes.

Four scenarios were developed by the group to better understand how different futures would affect facilities and facilities management. From this understanding, the group eventually looked for common threads which will define the role the facilities executive might play in helping higher education deal with the future. Space limitations do not permit us to present the four scenarios, but their implications were fairly clear.

## THE CHANGING ROLE OF FACILITIES MANAGERS

When the group looked at the scenarios it identified some important roles that the professional facilities executive could or must play to improve higher education in the future. While the following items are not exhaustive, they do reveal at least the framework for future leadership by the profession.

**Operational Effectiveness** – The future will likely continue to demand operational efficiency. This is probably an area in which current facilities managers are most comfortable. But operational efficiency in the sense traditionally known – shaving utility costs through energy conservation programmes or cutting custodial costs through industrial engineering techniques – may not be sufficient. Some emerging areas include negotiating energy supply contracts amongst multiple suppliers with varying terms, outsourcing for maximum value (not just cost) and using sustainable designs to minimise waste. But even more valuable may be the expertise to improve efficiency through analysis of operations, redesign of





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basic processes and selection of the most cost effective delivery system, not only in facilities management but in other campus operations such as telecommunications, transportation, residence hall management, food service, retail operations and other campus services.

**Strategy** – All of the scenarios seem to suggest a critical need for improved facilities management decision-making. Where will this come from? Who, for example, will suggest the divestment of unneeded buildings so resources can be redirected to more mission-critical activities? Such questions involve the development of strategy to position the alignment of facilities resources with the emerging needs of a college, probably even before those needs become self evident to the institution's academic executives. For the facilities manger, the role of strategist becomes ever more important – that is, devising the range of solutions a college may deploy beyond those it is traditionally conditioned to think about. Those in higher education are not alone. A recent article in *Building Operating Management* by Edward Sullivan titled "Facilities become Mission-Critical" comments on the changing facilities executives role: "As facility executives become more focused on broad corporate goals like productivity, traditional roles and boundaries begin to disappear. Salaries and bonuses may be determined less by the number of square feet in a portfolio than by the amount of space a company has shed. For executives responsible for the most tangible of assets, that shift may be unnerving."

**Partnering** – In the scenarios there is a reoccurring theme of industry involvement in the higher education enterprise, either as supporter or supplanter. Higher education has traditionally maintained a relationship with business at arms-length as a prudent buyer. Even when institutions solicit business for their financial support they are careful to preserve the institution's "independence", whether it be in research, sports or academics. Preserving such independence while yet building new and perhaps "unusual" partnerships with industry will be challenging. This suggests a higher level understanding of the institution's strategic interests as well as well-sharpened negotiating skills. Even if the relationships continue as they have in the past, the facilities manager will certainly look to its external suppliers of goods and services to become more involved in innovative problem resolution, beyond the simple response to a bid specification. This will require innovative structuring of new business arrangements, perhaps spanning many years.

**Asset Management** – In all the scenarios, there is a continuing emphasis on facilities, either to support dramatic changes in educational delivery or to preserve and enhance mission achievement. The deployment of capital in bricks and mortar or technology will require executives who can understand the concept of asset management from a financial perspective. Who within higher education will suggest how capital investments should be optimised? Who will analyse the range of options of how best to meet a programmatic need while minimising the need for new capital? These are questions related not just to "maintaining" a campus, but "managing" its capital assets. The degree to which the facilities manager can help direct an institution toward the optimal deployment of its assets will likely become increasingly important. Future emphasis will likely be on financial analysis, real-estate knowledge and skills, property management, capital budgeting and an understanding of capital sources and uses.

**Information Technology** – Information technology will have a significant impact on higher education although the pace and direction is still unclear. The scenarios uncover the potential for a rather radical change if advances continue as they have over the past decade. While facilities management has traditionally focused on space (its creation, operation and maintenance), the amount, type and location of space in the future will undoubtedly be affected by information technology. This implies that the application of this technology will be increasingly a matter of concern for facilities managers, just as they have learned to deal with other issues such as energy management, environmental protection, accessibility and other externally imposed forces. An understanding of this technology in both its potential and its limitations will be a necessity for the facilities manager in the future. From simply deciding what the capacity and configuration of the cable plant should be, to helping design and operate workstations, learning centres and production and transmission facilities, facilities management will be looked upon to make the "right" decisions. A working knowledge of the technology and its application will be an increasingly important requirement for facilities managers.

**Leadership** – To lead an institution in the solution of these issues, facilities managers must truly become facilities executives, having at hand both the tools unique to the profession as well as those common to executive decision-making. This will



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undoubtedly require that facility managers develop their abilities to see the situation as a whole and to frame their plans and solutions in the context of what is best for the organisation, not just its facilities. It will also require abilities to make concise and meaningful presentations, to write and speak well and to handle the "politics" of difficult situations or negotiations.

## PREPARING FOR THE FUTURE

There appears to be a growing consensus that higher education's success will be aided or hindered by the quality of its facilities and capital decisions, and by those that are entrusted to make such decisions. Faced with the harsh, cold realism about the complexity of what facility managers should do as a profession to serve higher education in the future, APPA has concluded that more investigation is needed in several of the areas noted above.

If the success of higher education will in part rely on improved facilities management and facilities decision-making, how can facility managers help accomplish this? They can dedicate themselves to identifying, researching and proposing development of management tools/techniques and educational programmes on emerging issues important to higher education and the management of their facilities. They can also pursue alliances with associations that already are well developed in some areas where facilities managers themselves are not, such as property management, construction management and real estate. Future alliances might help with delivery of some programmes such that resources and focus are better directed to the key strategic issues of higher education.

Facilities managers have well met these challenges in the past, and if their past success is any evidence of their ability to lead, then the future looks promising.

# BLURRING OF BOUNDARIES BETWEEN THE SECTORS OF EDUCATION

*by*

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In the context of trying to make best use of assets over the long term, by minimising outlay and maximising return, it is often suggested that the range of users and providers might be extended, with concomitant benefits to all. Let us blur the boundaries between the "traditional" user/client/provider of public facilities and all the others; it is not so simple.[3] From the point of view of the institution, there are always tensions, whether self-inflicted or imposed from outside. Some areas where these tensions occur in the United Kingdom are explored here.

## USERS

In broad terms, it is people and activities that use a university or college, but the idea of the "traditional" student who is a user is currently being questioned.[4]

If the "education" sector as a traditional concept is that which serves those people involved in the compulsory schooling years (5- to 16-year-olds for the United Kingdom), there are also those who want or need education outside those years, from infants to university students, to mature age students and in-service trainees. The obvious requirements which need to be met are those which involve differences in age, and accompanying factors – size, vulnerability, experience, expectations, money, etc.[5]

Even if people are at the same chronological stage in their life and education or training, they may be in different disciplines, more or less academically bent or more or less vocationally led. Are the different requirements as conflictual as some may make out, or are they useful excuses for the status quo?

## SUPPLIERS

It is clear that many countries are finding the provision of "public" facilities outside the statutory framework increasingly arduous. A putative solution put forward by the late Conservative administration in the United Kingdom was the Private Finance Initiative. This has been adopted by the new Labour government, with a change of name; it is now Public Private Partnerships. The principle remains the same: for capital financing, shift the risk; for recurrent expenditure, offload the servicing and maintenance burden.

At a recent conference run by the Facilities Management Graduate Centre at Sheffield Hallam University in the United Kingdom (which has three forums covering the health service, higher education and local government) some fairly startling examples were suggested: the possibility of a security firm offering to cover a group of establishments in one area; the possibility of a company offering facilities management across, for example, health and education establishments, so as to achieve realistic economies of scale; or the possibility of a university collaborating with a housing association to provide residences.

## EXPERIENCE

### Higher education (HE) versus further education (FE)

There has been a recent set of confrontations in the United Kingdom involving the National Audit Office (NAO), the Higher Education Funding Council for England (HEFCE) and the Committee of Public Accounts (CPA). The NAO wrote a report called *The Management of Building Projects at English Higher Education*



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*Institutions* (see review of the report in PEB *Exchange*, Issue 34),[6] it was damning. The CPA called the chief executive of the HEFCE, Sir Brian Fender, to account for the shortfalls discovered by the NAO and subsequently published their own report, equally damning.[7] To quote the Member of Parliament Maria Eagle, "In respect, for example, of teaching – one assumes that is classroom cost – it is £1 290 per square metre. I happen to have with me some costs per square metre in the FE sector of new buildings and the equivalent cost is £750 per square metre". This is to demonstrate the widely held view that higher education has much to learn from further education and its funding council, especially in these technical, value-for-money areas.[8]

### Compulsory versus post-compulsory

If higher education can learn from further education, can it also learn from the school sector? The Architects and Building Branch of the Department for Education and Employment have recently brought out a consultation paper on asset management in schools, which is being trawled and tested, to general acclaim.[9] Although pressures of income generation are not as heavy as they are in other sectors, the ideas on sufficiency, suitability and condition are as sound at the scale of a large university or group of "partner" colleges as they are at the scale of a Local Education Authority.

### Public versus private

What about the increasing numbers of facilities managers who are moving into higher and further education and bringing their "real work experience" from the commercial sector and other large public sectors (*e.g.* health, denationalised industries)?

## TENSIONS

### Users

There is a tendency in the United Kingdom at the moment for colleges, for 16- to 19-year-olds, that are facing difficulties to try to merge, either among themselves or with neighbouring universities. Many of these attempts have failed, often when there is too much of a "culture clash"; and, oddly enough, the government is not enthusiastic over this rush to rationalisation: in their view, on the whole, mergers are bad, while federations, or rather partnerships, are good. The distinction is a fine one.

Institutions that consider merging are subject to conflicting messages from the government. The following is a series of extracts from a recent letter of guidance from Tessa Blackstone, Minister for Further and Higher Education, to the Chairman of the Further Education Funding Council:[10]

> "We certainly wish to encourage improved collaboration between the further and higher education sectors. We see considerable benefits accruing to both sectors through the development of closer links, particularly where these facilitate lifelong learning. There may also be opportunities to use resources more effectively through closer working between the sectors. But... [we] need to be convinced that proposals... do not undermine the focus that institutions in the further education [sector] should have on the delivery of foundation and intermediate qualifications.
>
> We would also wish to be satisfied that... mergers... would not adversely impact upon other FE institutions... especially if the merged institution's higher education status would result in an unfair competitive advantage in recruitment to general further education provision.
>
> We would be concerned if mergers distract higher education institutions from their distinctive missions.... We should also wish to be satisfied that it would not be misleading for an institution in the higher education sector to use the title 'university' should it merge with a large FE college...."

It would seem that the "market" unleashed by the Conservatives is now being severely reined in. It is therefore not surprising that academic and administrative staff complain about inconsistent public policy.

As for missions and mission statements, are they not sometimes the last refuge of the scoundrel? This author was glad to see her view echoed by the current vice-chancellor of the University of Central England, "On the other hand, there are some business techniques that we should tear up into shreds. Mission statements, for instance, are an abject waste of time."[11]

If mergers are bad, federations or "partnerships" are good; one example is the recently established Higher Education and Training Partnership among Middlesex University and Barnet, Harlow, North East London and Waltham Forest Colleges, where students can take degree modules at any of the partnership colleges.

In any case, so far as people are concerned, at the micro level, differing needs and expectations can often be catered for by using time as well as space as a differentiator, and by keeping standards at a level which attracts all comers. So far as activities are concerned, adaptability and flexibility in planning and design will help lower the financial and difficulty factors of responding to inevitable change. New facilities should be designed so that they can be used, sold and/or transformed.

### Suppliers

With new players in the sector who have arrived from a non-educational background, there is the danger of a loss of involvement on the part of employees. The advice from institutions who have outsourced the provision of support services is to keep the old employees if at all possible, to train them and to keep decision-making as far down the chain of hierarchy as possible. With the right approach, technical employees have everything to gain from more "professional" bosses, with increased responsibility, more interesting tasks and better working conditions.

### Experience

In the case of post-compulsory mergers, there may be the problem of the differing status of the various teachers and the contractual formalisation, or lack of formalisation, of academic drift (something hinted at in Baroness Blackstone's concerns). In the case of schools, the very different legal status of the funding of compulsory versus non-compulsory provision may make close comparisons unhelpful.

Bringing in private sector expertise may result in a culture clash – a confrontation again of mission statements. There is the feeling that the private sector has a stereotypical view of the "old fogeys" who run higher and further education, and that the public sector does not trust the private sector, insisting on an unnecessary amount of monitoring.

To quote a speaker at a recent conference, "We've got to find a middle way" between the perception of incompetence of the public sector and the fear that the private sector will put profit before education.



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*Chapter 2*

# ASSET MANAGEMENT TODAY

# REVIEW OF SPACE NEEDS AND THE DEVELOPMENT OF NEW PLANNING STANDARDS IN HONG KONG, CHINA

*by*

*Nigel J. French*
Secretary-General
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Following a period of dramatic growth in the publicly funded higher education sector in the Hong Kong Special Administrative Region and faced with changes in the teaching and research environment, the University Grants Committee of Hong Kong, China (UGC) is undertaking a review of the space and accommodation needs of the eight higher education institutions for which it has funding responsibility.[13] UGC is also seeking to develop, with the help of consultants, new planning standards for the assessment of future capital works project proposals from these institutions. This paper describes the background to the review and outlines the progress so far and problems faced.

Hong Kong's higher education system is highly developed, on the lines of tertiary education in the Commonwealth tradition, and very diverse. All but one of the ten degree-awarding institutions[14] are predominantly publicly funded. The local age participation rate in higher education and higher vocational education is about 25%. Chart 1 shows that the increased availability of publicly funded higher education in Hong Kong is a relatively recent phenomenon however.

Particularly during the five-year period from 1991 to 1995, Hong Kong achieved a rapid expansion in its publicly funded higher education sector. There was a doubling of the number of first year first degree places, a 66% increase in the number of first degree students and a 123% increase in the number of postgraduate students. In consequence, student enrolments (in terms of full-time equivalent) at the UGC-funded institutions increased by nearly one-third from 1990-91 to 1995-96. Also during this period, some 3 500 new academic staff were recruited from all over the world but particularly North America and, to a lesser extent, the United Kingdom and Australia.

This rapid expansion of the higher education system led to the construction of many new buildings. Total capital expenditure during this period amounted to some US$940 million, mostly from public funds – although in one case nearly two-thirds of the construction cost of a new university was met by the Hong Kong Jockey Club from the proceeds of betting on horse-racing and the Hong Kong equivalent of a national lottery. The younger institutions are all in new or substantially reconstructed accommodation, and the growth of the older higher education institutions has required new buildings on their campuses also. The building stock is thus comparatively young. The 1997 age profile of existing academic buildings is shown in Figure 1.

The same is true of equipment, particularly scientific equipment, where the UGC has made special grants for updating to the older institutions, but also administrative equipment and plant associated with the functioning of the buildings. The 1997 age profile for larger items of scientific equipment is shown in Figure 2.

With a small number of exceptions, it can be said that the higher education institutions in Hong Kong currently occupy good quality buildings, many of recent date, and that they are well provided with modern equipment. Costs associated with maintenance of buildings, plant and equipment are presently low and even in the older institutions do not exceed 11% of recurrent expenditure.



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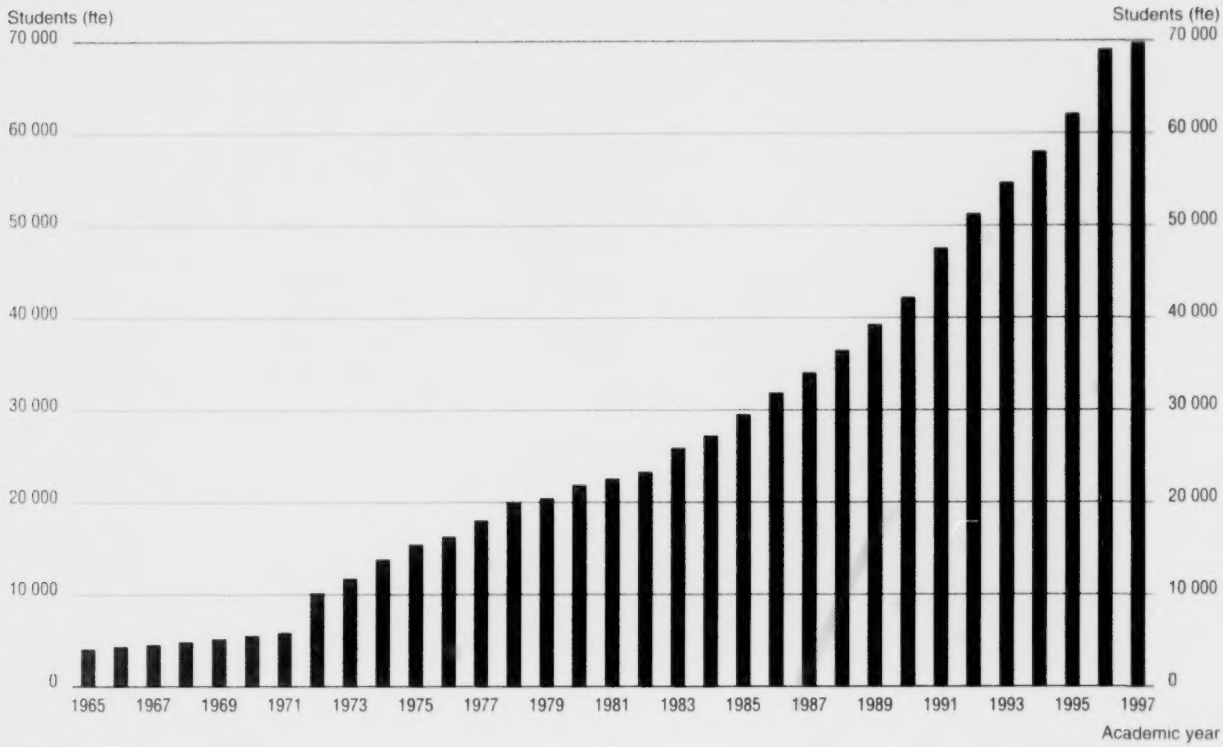
Chart 1. **Full-time equivalent students of UGC-funded programmes**




*Source:* Author.

Higher education in Hong Kong now occupies about 120 hectares (gross) of floor space on sites which total 300 hectares. These overall figures might suggest that the institutions are well-endowed with amenity space, but in fact some individual institutions are extremely cramped. The Hong Kong Baptist University has a gross floor space to site ratio of 2.7 and the Hong Kong Polytechnic University one of 2.0. Even the Chinese University of Hong Kong, and the Hong Kong University of Science and Technology, with gross floor space to site ratios of 0.25, have a good deal of land which, because of its steepness, is of little practical use.

The UGC judges whether an institution has sufficient space, or needs additional buildings, on the basis of a set of UK-based "space norms"[15] which relate to purpose. For example, engineering departments, assuming that they have a student/staff ratio of 9, require 9.8, 16.6 and 17.9 square metres net per full-time equivalent (FTE) student for undergraduates, taught postgraduates and research postgraduates respectively (net floor space is usually about two-thirds of the gross area). Libraries attract 1.46 $m^2$ net per FTE student and lecture theatres 0.5 $m^2$ net per FTE student. There are norms for central administration, social, sports and welfare activities. On the basis of these norms, two of the UGC institutions (City University and Polytechnic University) have small deficiencies of floor space and the remainder surpluses ranging from 16 to 26%. However, particularly in the case of the older institutions, space may not be conveniently arranged for present day teaching and research, and some space (*e.g.* museums) serves public as well as institutional purposes.

As well as determining total available space, the UGC is also interested in its utilisation. UGC higher education institutions have teaching years varying from 28 to 32 weeks. In the remainder of the time space is used for examinations, short and part-time courses, conferences and, particularly, research. Nevertheless, overall utilisation outside the teaching year is low. Within the teaching year, the UGC divides space into General Teaching Areas, where it expects 50% occupancy for 30 hours per week, and Special Teaching Areas, where it expects 50% occupancy for 22 hours per week. Surveys by the UGC in





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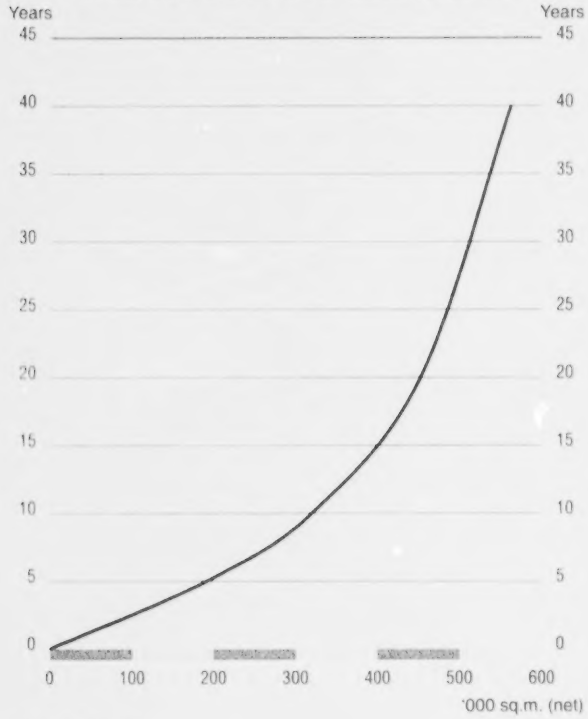
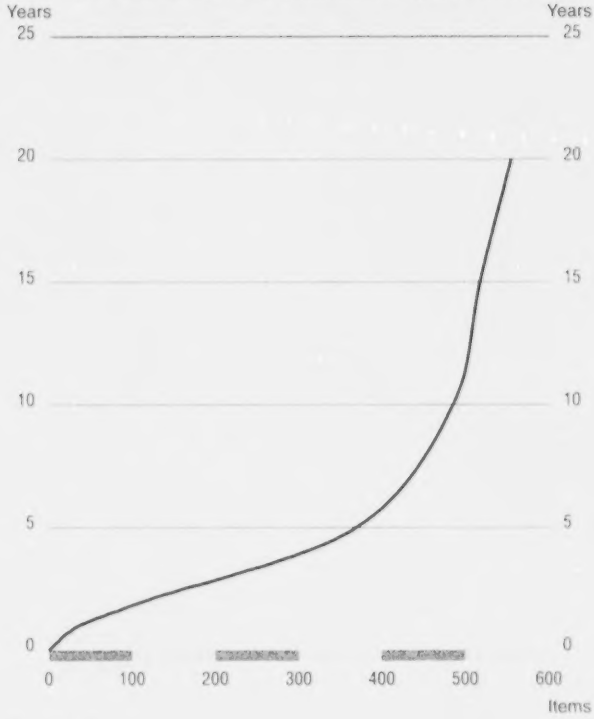
Figure 1. **Age profile of academic buildings in the UGC-funded institutions (1996-97)**




*Source:* Author.

Figure 2. **Age profile of major scientific equipment in the UGC-funded institutions (July 1997)**




*Source:* Author.

1992 and 1996 suggested that the institutions met, or nearly met, the standard for General Teaching Areas, but that utilisation of the Special Teaching Areas was low.

However the UGC has for some time been uncertain about whether the previous UK UGC norms still reflect current space use and needs for higher education and whether the utilisation surveys were sufficiently accurate and representative. Accordingly the Grants Committee decided in 1993 to form a Working Group on Space and Accommodation, comprising mainly members but also having some participation from the institutions. The Working Group was tasked:

- to review the total space provided to institutions up to 1997-98, including space which would be available after completion of projects under construction;
- to clarify how the total space available to the institutions is allocated within the institutions;
- to provide a basis for the development of new planning norms suitable for UGC-funded institutions in Hong Kong;
- to identify buildings and structures where space may not be fully and efficiently used.

After several rounds of discussions and consultations with the institutions on the basis of the utilisation surveys referred to above and other data collection exercises, the Working Group concluded in 1997 that it needed the advice and assistance of expert consultants to undertake a more focused study.

The objectives of the consultancy that followed were:

- to recommend a methodology acceptable to the UGC with which to assess, at a macroscopic level, the adequacy of the UGC-funded institutions' current and approved planned space and accommodation (both publicly funded and privately funded, but assessed separately), and submit details of the methodology



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used in a form applicable for further use by the UGC;

- to carry out the assessment using that methodology;
- to advise on the extent (in terms of net square metres or in percentage terms) to which each institution is currently over- or under-provided with space and accommodation for its present and approved planned levels of activity.

The scope of the consultancy as described above is deliberately limited and specifically related to the institutions' "present and approved planned levels of activity". In addition, however, the UGC hopes to be in a position to take into account how the institutions may be expected to function in the future, including changes in the nature of teaching, learning and research, and to assess what facilities might be required in the event of further expansion in the next decade.

In the latter context, the UGC and the institutions will need to be able to assure the government and the community that the existing space and accommodation occupied by the institutions are fully and efficiently utilised, before a case can be made for significant additional public capital investment. Quite apart from the need to justify the development costs of new facilities (and the cost of building anything in Hong Kong is higher than anywhere else in Asia apart from Japan), the opportunity cost of the land occupied by higher education institutions in Hong Kong is very high, because of the overall scarcity of developable land in the Special Administrative Region.

# ASSET MANAGEMENT: TODAY'S BEST PRACTICE

*by*

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## BACKGROUND

The role of the Department of Education and Training (DET) is to provide lifelong education and training opportunities to the people of New South Wales (NSW). Schools and colleges provide the focal point for student learning.

In order to provide the capability to deliver these education services a number of support processes have been established. These include processes for providing curriculum materials, trained staff, accommodation and facilities, equipment, technology infrastructure, support services and funding.

The focus of this paper is on major changes made to the process of providing accommodation and facilities. The DET has a significant asset base in the form of land, buildings and associated facilities which are located to meet demographic and industry demand. The asset maintenance and facilities management process is undergoing major changes with a view to using resources more economically, efficiently and effectively, and to providing a better service to the many and varied clients of the Department.

Key areas of change include the following:

- Developing and implementing practices and procedures in accordance with the NSW Government's Total Asset Management initiative and the Department's strategic plan in addressing the issues of asset acquisition, maintenance, operation, enhancement, de-commissioning and disposal.
- Development of improved asset maintenance and facilities management capabilities through the use of advanced technology and the introduction of the Asset Management Systems (AMS). A project to develop and implement the AMS has been divided into a number of stages with the first self-contained stage having been implemented in July 1996.
- A change to the previous method of maintaining schools from a cyclic or programmed approach to one that is condition-based. This new strategy provides maintenance services to every school, every year. Under the new arrangements, contracted private firms will provide all schools with 24-hour maintenance support.
- Development of a set of schools facilities maintenance standards and the use of hand-held computer technology to assist in recording details on the conditions of school facilities.

These initiatives are to be extended to the college sector within the Department.

### The DET asset base

The Department of Education and Training is responsible for the education of over 1.1 million school and college students. With 100 000 employees, including teachers and ancillary staff, and an annual budget of A$ 6.8 billion DET is the largest agency in New South Wales and one of the largest single organisations in the country. There are 2 220 public schools and 128 colleges with property assets valued at approximately A$ 15 billion.

### Total Asset Management framework

The NSW Government has adopted a Total Asset Management (TAM) strategy across all of government



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which aims to assist agencies in the efficient management of their assets.

TAM strategy changes the emphasis from asset creation to asset utilisation based on service delivery. Within DET, the Properties Directorate is required to manage its property portfolio within a TAM framework.

## PROBLEMS AND OPPORTUNITIES

### Problems

Property asset management has always been a major challenge for the Department. This can be largely attributed to the sheer size and diversity of the property portfolio as well as its geographical spread across the state.

The Department is a complex organisation with a unique culture. The nature and status of schools and colleges within the community add to the challenge of asset management. This environment seems to magnify the universal problem of demand for resources exceeding the limited supply.

The processes and organisational structures which evolved over the years, based on paper-based work flows and older management styles, have become increasingly inappropriate. These processes could not be expected to continue in coping with the changing needs and expectations of the community.

These processes were not particularly effective in allowing the cost-effective delivery of services. For example, school maintenance was performed on a cyclical or programmed approach, which allows a degree of inefficient resource allocation, rather than on a needs basis. Prior to 1995, resource allocation was often inconsistent as decisions occurred in ten regional offices using different philosophies.

The processes in place, and the staff responsible for them, were not supported by up-to-date and consistent information. Where the information was available, it was often difficult to access or had to be derived from disparate sources. In order to effectively manage property assets, there was a need for reliable asset information and the environment in which they existed. This included:

- where the assets were located;
- what the asset was and its size;
- the condition of the asset;
- where demand existed or was likely to come from in the future;
- where surplus or under-utilised assets existed.

The cumbersome processes and the lack of adequate information did not allow the Department to take full control over its properties environment. Actions tended to be more reactive rather than proactive.

The major challenge was to know and understand exactly what constituted its properties environment and, having achieved this, to take control and proactively manage the environment.

### Opportunities

A number of opportunities have arisen in recent years which, together, have allowed the Department to undertake major changes to the process of providing teaching and learning facilities.

A very important opportunity was provided during the move from cash-based to accrual accounting. During this period it became necessary to provide extensive asset information required to meet the needs of accrual accounting reporting.

Another opportunity arose with the NSW Government's Total Asset Management initiative. The push for a consistent state-wide approach by the government was in line with Properties Directorate management thinking at the time. In broad terms this required a refocus from capital investment for asset creation to the management of assets from a whole of life and system-wide view.

Using TAM as a conceptual framework, the Department was able to take action to optimise the delivery of services. In order to do this, processes had to change dramatically. The time was right as there was a general climate of change and acceptance of the need to find better ways to develop services (and reduce costs). During this period, there was a Departmental re-structure which centralised control over properties and provided the opportunity to implement specific changes within the properties environment. There was also increasing acceptance of the use of outsourcing as a means of gaining access to a range of skills not normally required as part of core business.

In order to support the new processes and the staff responsible for them, it was agreed to develop sophisticated information systems. The availability of the following enabling technologies was critical to the development of an Asset Management System to underpin the processes:

- geographical information systems (GIS);

- 64-bit computer processors;
- hand-held computers with pen-based operating systems;
- hand-held GPS and surveying instruments;
- "point and click" ad-hoc query tools.

In addition to these technologies, the availability of data sets such as the Digital Cadastral Data Base (DCDB) and the Australian Bureau of Statistics census data were important aspects for the new system.

It was now feasible for accurate information about the assets to be captured more efficiently, and for these assets to be displayed graphically in their "real-world" position. A range of tools could now be developed which were easy to use and would provide quick access to reliable information.

## OBJECTIVES AND CRITERIA FOR SUCCESS

The Department implemented an ambitious programme of reforms designed to link resources to performance. An important component of educational resources includes the provision of accommodation and facilities that encourages teaching and learning in a conducive and safe environment. Within this framework of reforms, the Department's high level asset management objectives are to:

- ensure priorities are established which are in line with the strategic objectives;
- ensure financing and expenditure is planned and controlled in accordance with these priorities in order to deliver a cost-effective service;
- provide facilities, flexible in design, to meet the changing curriculum and community demands;
- ensure accommodation and facilities are provided and maintained in a way that is effective and promotes equity across the state.

Specific detailed objectives of the changes being implemented (and criteria for success) are to do the following:

- take a conscious step towards a more proactive and strategic approach for the management and maintenance of property assets;
- ensure better asset management through planning with the development of Capital Program Plans, Asset Maintenance Plans and Asset/Property Disposal Plans that are based on reliable and up-to-date asset data;
- ensure resource allocation is based on identified priorities, actual needs and equity;
- achieve an overall increase in pro active actions at the expense of reactive actions in asset maintenance and facilities management;
- ensure and measure client satisfaction with services provided under the new processes;
- implement information technology solutions that will provide reliable and easily obtainable information in relation to the location, size, condition, utilisation and other details of property assets.

## ALTERNATIVES

Once the problems had been identified and the objectives defined, there was never any question of accepting the alternative of continuing to operate in the present manner.

The vision was to use the opportunities that were available to create a whole new properties environment which excluded the alternative of merely tinkering with the present systems.

The NSW Government's Total Asset Management initiative coupled with the Department's restructuring provided too great an opportunity to miss. The decision to fully encompass the vision and "get it right the first time" was made.

## WHAT WAS DONE TO ACHIEVE BENEFITS

As stated earlier, the prime challenge facing the Department was identifying and understanding exactly what constitutes its properties environment and, having done this, to take control and proactively manage it. This would involve cultural changes, dramatic changes to processes, re-organisation and training of staff, introduction of advanced technologies, major data capture exercises and partnerships with other organisations. This made for an exciting and stimulating time for those involved. The key areas of change are outlined below.

### Embracing the TAM initiative

The first step in the introduction of a controlled and more disciplined approach to asset management was achieved through adoption of the NSW Government's Total Asset Management initiative. This became the conceptual framework for other changes being considered. TAM, as defined by the Department, is the sum of all those activities that lead to the provision of infrastructure appropriate to the cost efficient delivery of educational services. Those activities have the following major strands:

- identification of the need for an asset;
- provision of the asset including its refurbishment;
- operation of the asset including its maintenance;
- disposal, and thus effective removal of the asset.

Adoption of TAM provides a structured and systematic approach to the acquisition of sites, provision of capital works and the maintenance of facilities. It assists in obtaining value for money and provides guidelines and directions which promote accountability.

Taking the TAM framework from concept to reality has involved a major overhaul to the processes involved in providing teaching and learning facilities. Critical to these changes was the development and implementation of advanced technologies which would support the processes. The Asset Management System (AMS) is the application which underpins the new processes.

### The Asset Management System

The AMS is a comprehensive series of integrated modules. The system incorporates a geographical information system (GIS), as well as a relational database management system. The GIS is designed for the collection, storage, retrieval, analysis and display of spatial data in the "real-world". The AMS provides a seamless link between the database and various maps, plans and other spatial layers available for display. Thus any item recorded within the database (*e.g.* a parcel of land, building or room) can be displayed on any number of maps or plans in its "real-world" position. The spatial interrelations which can be highlighted using the AMS provide a new dimension of information for use in managing the Department's large asset portfolio.

The first stage (AMS1) of the total AMS project was implemented during July 1996. It contains two key modules:

- Sites Management – a comprehensive record of all the land that the Department owns, leases, controls or is interested in using or acquiring.
- School Facilities – information on school buildings, rooms, demountables, amenities and the elements associated with each of these (*e.g.* room floor covering, building fabric and heater type). This includes plans and diagrams of school grounds and facilities.

Development of the next phase (AMS2) commenced in December 1997 and includes three further modules – Asset Maintenance, Demountable Management and Asset Planning. Additional modules relating to project/programme management, risk management, heritage assets and office accommodation are being planned to further extend the system's capabilities. Further work to extend the systems to the vocational colleges will also be undertaken.

A key element in the AMS is the user friendly interface. Most high level GIS-based applications require a technically trained operator as these systems are generally driven from a command line. The AMS is completely driven by mouse operations such as pointing, dragging and clicking on buttons, on various menu options or directly onto displayed spatial views. High powered commands, a range of flexible spatial analysis tools, inquiry facilities, pre-defined and ad-hoc reporting capabilities are all built into the interface. Increased productivity has been gained through staff being property managers not computer experts.

Users see the AMS operating on three levels to provide information they could not previously readily access. The first level is as a simple **recording** mechanism that stores facts and figures that can be retrieved as required – for example, the size of the hall at Picnic Point High School. The second level is at an **operational** level that is used by managers – for example, identifying schools that have undersized libraries for their enrolment size which in turn may require capital upgrades. The third level is at a **strategic** level that is used by senior decision makers – for example, determining the equitable distribution of a scarce resource across schools through direct comparison on a set of pre-determined criteria.

In conjunction with the development and implementation of AMS, two major data capture projects had to be undertaken. These were the Schools Data Capture Project and the School Condition Assessment System (SCAS).

### The Schools Data Capture Project

With the AMS providing the technical ability to easily store, retrieve and manipulate a large amount of both spatial and aspatial data into meaningful information upon which better business decisions could be made, it became imperative to capture this data.

Advances in technology made this task possible and to the level of accuracy, required by users, that would enhance the spatial capabilities of the system. Using the latest survey measuring equipment and Computer Aided Design (CAD) systems, a Schools Data Capture Project was implemented to capture data from all departmental schools in NSW to a level of accuracy of 98% within buildings and 95% of buildings and other features within school boundaries. The project captured, amongst other items:

- **site** elements, such as measurements, access roads, site boundaries, bubblers, fuel tanks, sporting facilities, playground equipment and covered ways;
- **building** elements, such as measurements, building outlines, style, function, number of stories, building materials, air-conditioning, ceiling heights, ramps and stairs;
- **room** elements, such as measurements, floor plans, wall and floor materials, usages, window areas, heater types and doors.

Following capture, the data was converted and registered to the state's cadastre on the AMS.

### The School Condition Assessment System (SCAS) Project

With relevant data now readily available and easily manipulated in the AMS, the move from a largely re-active property service operation to a more proactive and strategic approach for the management and maintenance of property assets was taken.

A School Condition Assessment System (SCAS) was developed which allowed information relating to the condition of school facilities to be captured using a hand-held computer with a pen-based operating system. The SCAS works in conjunction with the AMS. Plans and other details of buildings and rooms are loaded into SCAS from AMS data. Condition assessment and repair details captured in the field using SCAS is reloaded into AMS for further analysis as required.

This maintenance strategy changed the previous method of delivering school maintenance from a cyclic approach to one that is condition-based using third party contractors.

### Schools facility maintenance contracts

The contracting method to meet the condition-based approach to school maintenance involves six-year, multi-site, multi-activity contracts with an emphasis on performance standards rather than descriptive works. The focus is centred on achieving an increased level of satisfaction for the client, including the school community, via more direct contact with the contractor.

Based on a framework of maintenance classifications and standards, condition assessments of assemblies, elements, rooms, buildings and schools are used to determine and prioritise a state-wide programme of maintenance and replacement works against which maintenance contracts are established. Implementation of this system enables the Department to know the condition of every building across the state together the costs of maintaining them to an appropriate standard for a six-year period.

### The infrastructure to maintain data and provide support to departmental staff

AMS data capture ensures that the effort required by users is minimised. Where possible, data capture and updating is built into various sub-processes.

An outsourced data manager provides specialist data updating and conversion services. The contractor is responsible for converting and loading all spatial and related attribute data obtained from sources such as the Department of Public Works & Services, the Land Information Centre and local governments. Similarly, all hardware and software maintenance services are outsourced. This allows the Department to run a complex system using large data sets (approximately 14 gigabytes) without having to maintain a team of specialist and highly skilled staff.

### Vocational colleges

The next challenge for the Department is to extend the system into the vocational colleges. These buildings tend to be more complex because they contain significant building services such as air conditioning, lifts and extraction systems. There will be a need to develop appropriate performance standards so that these can be incorporated into facilities management contracts similar to those implemented for schools.

## RESULTS ACHIEVED

The NSW Department of Education and Training is the largest agency in the state, with total assets of around 7.7 million square metres distributed between 2 200 schools and 128 colleges. Management

of this asset base posed a unique problem to the Department with the introduction of Total Asset Management philosophies and an accrual-based accounting system.

Rather than adopt a reactive position the Department embarked on an ambitious programme based on sophisticated electronic management information systems, an extensive data capture project, a switch from cyclic maintenance to condition-based maintenance planning and the use of facilities management contracts to implement the changes.

After around 12 months in operation and a few "teething" problems, the new system had gained general acceptance within the school community. The data now available enables the Department to know the current condition of every building in the asset base together with the resources required to maintain the buildings to the appropriate standard.

The systems and processes described above are not unique to the education sector. They can be applied to any agency with a significant physical asset base.

# MANAGEMENT OF SWEDISH UNIVERSITY PREMISES

*by*

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The Swedish system regarding university property is quite unique in Europe, and probably even in the rest of the world. In Sweden universities are not allowed to own property or physical facilities like buildings. Why does the country have such a system? A short lesson in the history of Swedish universities will help explain.

## HISTORY

Universities have been a reality in Sweden since 1477, when the University of Uppsala was founded. The first university in all of Scandinavia, it was for a long time the most northern university in the world.

A university was at that time mostly a matter for the church. Although the State of Sweden gave the university legal status, the church financed its activities and was responsible for the educational system. At the time the Church of Sweden was Roman Catholic, but since 1523 Sweden has been dominated by the Protestant Church. The change resulted in less influence from Rome and a shortage of resources over the next 80 years.

In 1617 Gustav II became king of Sweden, and this was the beginning of era when the country was a major political power in Europe. The king understood that a powerful country needed well-educated inhabitants. The combination of ambitions for political power with culture and education was important for the future development of the Swedish universities. As a sign of support, King Gustav II donated large assets to the University of Uppsala, mostly in the form of land, farms and forests. These assets gave the university economic stability and were the starting-point for a major expansion of its activities.

In 1666 a second university was founded, in Lund. With this expansion of the Swedish academy the financial situation of the universities plunged again, worsened by low prices of grain and timber, and they could no longer maintain their buildings. At the beginning of the 19th century, university buildings were in very poor condition and a reorganisation was necessary in order for the university system to survive.

It was in 1830 that the Swedish parliament decided to transfer all university property to the state and declared that public funds would finance all university activities. This reform was welcomed by the universities and has remained in force since that time.

State owned property was managed by various authorities between 1830 and 1918, when *Kungliga Byggnadsstyrelsen* (The National Board of Public Building, KBS) was given the responsibility. KBS, like the previous authorities, was responsible for the operation and maintenance of the property. When universities needed new buildings or major changes to exiting ones, they would apply to the Department of Education at the same time as they asked for funding for their activities. The Department gave priority to projects according to a national list of investments at universities, and the Parliament made the final decision when voting its next budget.

## THE STATE REFORM OF 1993

At the beginning of this decade, the government worked further on reforming the ownership of state property. The state remained convinced that universities should not own property and should continue to receive grants, including money to rent their



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premises. The universities alone could decide how to spend the money. The purpose of the reform was to give universities more autonomy and increased competition in the real-estate market. This was expected to minimise the costs for university premises.

Though some universities, such as the University of Uppsala, lobbied strongly for the right to own property, in 1993 the reform was adopted according to the original directives. The universities were only allowed to rent their premises, but they could decide for themselves on how much to rent and from whom.

It should be mentioned that all Swedish universities are under state authority. The government elects the members of the board and the vice-chancellor, after the university presents its proposals.

Most grants[16] for education and research come from the Department of Education, although funds for research provided by trade, industry and independent research foundations are currently on the rise.

After the reform in 1993, university property was transferred to a state owned real-estate company, *Akademiska Hus* AB. The restructuring of state property ownership underwent a thorough evaluation in 1997-98. The report showed that a clear majority of universities and colleges found that *Akademiska Hus*, with its unique image as owner solely of university estates, supplied good educational and research settings in a professional manner. The universities expressed their satisfaction with the results of making a company out of an authority.

Based on that report, in May 1998, the Parliament of Sweden declared that *Akademiska Hus* would continue to be the manager of university property and would remain under the sole ownership of the state.

## AKADEMISKA HUS

The business concept behind *Akademiska Hus* is the following: "*Akademiska Hus* offers universities and colleges attractive and efficient study and research environments. The company is at the forefront in the development of these environments and its operational platform is long-term ownership and management."

The parent company *Akademiska Hus* AB (AB refers to a Limited company) and its eight subsidiary companies are located in seven university cities – Luleå, Umeå, Uppsala, Stockholm, Linköping, Gothenburg and Lund – and Ulltuna. Each subsidiary has one large university as a tenant (Stockholm and Gothenburg have more than one) as well as a number of colleges.

Here are a few facts about *Akademiska Hus* (as at 31 December 1997):

- Property holdings totalled 2 783 388 square metres of rental space, mainly in the form of specialised buildings rented to universities and colleges (96%).
- Leasing income for 1997 was 2 991 million Swedish krona (600 million Australian dollars).
- The book value of its property portfolio totalled Skr 16 030 million.
- In 1997 the group invested Skr 1 441 million.
- In 1997 *Akademiska Hus* had 360 employees.

### The creation of *Akademiska Hus*

The new company was organised in a modern a rational way with considerably fewer employees than KBS. To be hired at *Akademiska Hus*, staff of the National Board of Public Building had to apply for positions. If the applicants had the required qualifications, they were offered employment, if not the position went to an external candidate.

The new situation provides universities a choice of negotiating parties when new premises are needed. They can also choose either to rent existing estates or have new ones built.

The parent company is in charge of the overall management and finances of the entire group. The subsidiary companies work mainly in direct contact with the universities and are responsible for the construction, running and maintenance of the estates. Each subsidiary is headed by a managing director and is composed of:

- an administration unit responsible for the budget and personnel;
- a construction unit responsible for project and construction management;
- engineering services responsible for operations and maintenance.

*Akademiska Hus* hires its own staff of experts as well as hiring the services of external consultants and businesses. About 80% of its engineering services are provided by in-house engineers and experts. All maintenance and new construction are outsourced. Though in certain subsidiary companies the head of the building administration is an architect,



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for every new project *Akademiska Hus* pays an outside architect along with consultants for engineering services. *Akademiska Hus* staff is responsible for co-ordinating project financing and planning with each university.

### Facility management at universities

In order for universities, with the help of *Akademiska Hus*, to organise and plan for future development, there is a facilities management structure at each university. The University of Umeå, for example – which counts 21 500 students (14 000 full-time), 3 800 employees and 210 000 $m^2$ of premises – has a Department of Facilities and Services, with a total staff of 232, that is organised as follows:

- Development of physical facilities (campus development, project development)
- Leasing Negotiations
- Furnishings
- Equipment (purchasing, computer network, alarms)
- Removal service
- Security
- Environment

  Staff: 15
- Telephone service

  Staff: 7
- Postal service
- Caretaker service
- Office shop
- Printing service
- Surveillance staff for exams

  Staff: 70
- Cleaning service

  Staff: 140

It should be noted that in Sweden, as in the rest of Scandinavia, the local community is responsible for student housing.

### Leasing contracts between universities and *Akademiska Hus*

Before the reform of 1993, the former authority KBS had established rental agreements with the universities (all premises had a rental price), and the costs were covered by a special state grant for premises. Those rental agreements were transferred to *Akademiska Hus*.

Rental agreements average eight years, lasting three years for older buildings and 10 to 15 years for newer ones. In 1996 short-term agreements were renegotiated for the first time, and the original rents were reduced by 10 to 15%. This can be attributed to Sweden's more stable economy after 1993, with decreasing interest rates and low inflation. However lower rents were certainly also made possible by savings brought about by more effective management of university premises.

Table 1. **Space of rented premises at Swedish universities**

| University | Square metres of space | Space per full-time student ($m^2$) |
|---|---|---|
| Lund | 461 330 | 15.8 |
| Gothenburg | 264 160 | 12.7 |
| Linköping | 147 600 | 12.3 |
| Stockholm | 254 980 | 12.2 |
| Uppsala | 355 260 | 19.1 |
| Umeå | 210 980 | 15.4 |
| Luleå | 96 390 | 16.2 |
| **Technical Education and Research** | | |
| KTH, Stockholm | 242 165 | 25.9 |
| CTH, Gothenburg | 197 400 | 28.2 |

### Swedish universities today

Swedish universities expanded greatly in the 1960s and 1970s, as was the case in most European countries. The number of universities increased from four in 1964 (in Uppsala, Lund, Gothenburg and Stockholm) to seven in 1970 (with the addition of those in Umeå, Linköping and Luleå). Student numbers at the universities in Sweden reached about 150 000 in 1975. Between 1975 and 1990 student numbers did not change, but the universities continued growing. The volume of research grew three to four times during that period, and the number of researchers increased substantially.

Since 1990 there has been new growth in tertiary education, and in 1998 the number of students doubled to 300 000. A large part of this growth has been at small and medium-sized university colleges. Since 1977, 17 new university colleges have been founded in Sweden; university colleges offer an academic education but have no grants for research. There has





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been a conscious regional policy, in the 1990s, of locating many of the new educational places at these university colleges.

In summer 1998, the Swedish Government decided to give three university colleges (Karlstad, Örebro and Växjö) the status of universities beginning 1 January 1999. As a consequence they receive grants to develop research.

The increasing demand for educational places in the country is mainly due to the fact that the number of young people continuing their studies at university is constantly increasing. Economic depression, the transformation of society from industrial to knowledge-based and rising unemployment in Europe have contributed to the increase. Still a relatively low percentage of the population between 18 and 30 years old continues to study at universities in Sweden, compared to the rest of Europe.

### *Akademiska Hus* – One of the largest builders in Sweden

The important expansion of universities in Sweden due to the development of research and education coincided with the forming of *Akademiska Hus*. As a result, during its first five years of existence, the company became one of the largest Swedish builders, with investments between Skr 1 500 million and Skr 2 000 million a year. It also provided the country with a number of modern university premises.

Swedish university premises compare favourably to other universities in the world as concerns space as well as standards. Because of Sweden's severe climate, with snow four to eight months a year, high standards in indoor climate and materials are particularly important and their quality ranks high on the international level.

### Benefits of change

How has the change from the authority KBS to *Akademiska Hus* led to something better for the universities? There is general agreement among Swedish universities, confirmed by a Gallup poll in February 1998, that *Akademiska Hus* is easier to collaborate with and is far more efficient as regards the planning and building of university premises.

One important reason why the state created the new relationship between the universities and *Akademiska Hus* was to encourage negotiations between the parties and to allow external building owners to compete in renting premises to the universities. The state also hoped that the universities would use their premises more efficiently.

Experience shows that some universities, especially the smaller university colleges, have chosen building owners other than *Akademiska Hus* when planning for new buildings. The reasons for this vary. Many university colleges have property holdings of less than 50 000 $m^2$. It can be difficult for *Akademiska Hus* to be represented in such places and easier for local building owners to offer a practical solution for the premises.

In other cases, especially projects in Sweden's major cities, large real-estate companies, quoted on the stock exchange, can offer the universities better deals than *Akademiska Hus*. They may be prepared to take bigger financial risks than *Akademiska Hus* or speculate on future increases in the value of the buildings.

The fact that universities and university colleges have chosen other solutions shows that there is a genuine competition between actors and that the free market influences the costs of building and managing university premises in Sweden today.

What about the use of premises by universities? At present there are no clear signs that universities in Sweden will rationalise the use of their premises. While over the last ten years Swedish communities have been forced to drastically reduce spending on premises at primary and secondary schools, there are no such signs at the university level.

*Chapter 3*

# PLANNING FOR THE FUTURE – WORKING GROUP OUTCOMES

# THE IMPACT OF INFORMATION TECHNOLOGY ON FACILITIES PLANNING

## GROUP A

The question was asked whether there was any evidence that information technology reduced space requirements and proved effective in reducing building costs. Though there are examples of such reductions in the commercial sector due to the policy of "hot desks" and "hoteling" (for example, when staff, who are frequently away from the head office, book a space only when they need it instead of having one reserved for their exclusive use), this does not seem to be common in educational institutions. In fact an increase in costs has sometimes been the case because more flexible spaces with higher levels of technological services were demanded.

No longer does the standard seminar room with the white board and seats in a row suffice, but the room which can be used for group learning by one class and cluster learning the next is necessary. To be truly flexible such a room requires computer outlets, video outlets, the associated security systems and an air conditioning system to compensate for the heat generated by this equipment. The use of information technology for flexible learning can increase the requirement for space, because break-out rooms are required around the group teaching space.

A goal for strategic facilities management must be to help the academic user to understand the difference between having the space and equipment versus making better use of existing space and facilities. Therefore the resources and focus must also be towards training users to manage space more effectively.

There is not a standard space model. Some institutions are reducing the number of traditional lecture theatres where others are not. It has been the experience in the technical and further education sector that the younger students would not study from home via computer as they enjoy coming to college to meet their friends. Therefore lecture theatres are required. However, mature age students, who are often employed, preferred working from home.

Wise facilities managers will not waste time attempting to determine the impact of technology on facilities planning, but provide adaptable space that can change with the future.

Are academic developers being involved in achieving this aim, and are they the right people to involve? The discussion concluded that whereas the academics should not be excluded, it was felt that many of them were too close to the problem to offer innovative scenarios.

## GROUP B

### Global information networks

Historically, the conventional wisdom has been that tertiary institutions would aim to be "all things to all people". However, with the advent of global information networks and as those networks have become more sophisticated and accessible and as more people are familiar with the technology, the pressures will be for institutions to specialise. It is this process that will enable the technology, but it is market research that will provide information on the needs of an institution's clients.

Global information networks will therefore support greater diversity and specialisation amongst tertiary institutions. There will be funding pressures to decrease the number of research universities. There will also be the emergence of universities in the style of Western Governors University in the United States where the institute owns the accreditation process only, and it contracts in the necessary content specialists and facilities. This model has relevance in particular circumstances and will not be applicable where clinicians are to be trained and/or major capital investment is required.

An institution's clients will include not only the traditional student body, but under funding



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pressures the term "clients" will also have to cover industry and commerce, staff and more generally the community at large.

The "reach", which global information networks enable, will facilitate:

- more strategic alliances to better meet clients' needs;
- clients' looking more and more for internationally accredited outcomes;
- access to the best academic staff which will become easier and far less influenced by their physical base;
- institutions being able to franchise their products more readily.

Theoretically the concept of students "buying" their education through a pre-paid voucher system will be facilitated by global information networks. However, irrespective of the technology, the voucher concept would introduce a level of risk management to tertiary institutions which raises serious doubts about the net value of the concept. The one known instance where a voucher system has been attempted was a failure. This failure was not a function of the information networks within that system.

## GROUP C

### Facilities management

As more sophisticated facilities management systems are developed, information will become increasingly important to the facilities manager in making strategic asset management decisions and advising the governing bodies and the chief executive officers on matters likely to influence the strategic direction an institution chooses to take on the development and management of its facilities assets.

### Facilities budgets

The demand for the most current information technology seems to be ever increasing. The life cycle of software, hardware and networks ranges from a year to a few years. Keeping up with information technology requires a substantial recurrent investment, even once the basic infrastructure is in place. With the physical fabric of so many tertiary institutions suffering from significant deferred maintenance, as well as lack of functionality, non-compliance with safety and building codes, etc., IT may well be funded at the expense of these areas of need. Under this scenario, physical facilities are likely to fall further and further into a state of unfitness for purpose.

### Teaching and learning methods

Information technology will always offer opportunities for teaching to be carried out in different ways. Facilities will need to be able to cater for frequent updating of IT in a minimally disruptive way. To date, IT has been injected into existing lecture theatres and classrooms. In the future those facilities may not be appropriate, particularly with an increasing focus on creating learner-centred environments.

### Types of facilities

As student ownership of portable computers increases, there is likely to be an increasing demand for being able to tap into the network from many locations. Although cordless communications between laptops and networks are already possible through the use of mobile phones, the high recurrent costs of this form of network link, at present, will probably dictate the need for network connection points to be made available in a range of locations on campus. Areas such as Internet cafes, student lounges, classrooms, laboratories and computer labs may all see the provision of Internet points in the near future.

An increased use of computer modelling in disciplines that traditionally relied on wet laboratories, such as chemistry and anatomy, is likely to see a greater demand for computing facilities for that purpose. As these facilities become more widely used, it should be possible, in a no-growth environment, to reduce the number of wet laboratories and therefore reduce the total cost (liability) of modernising them.

Where distance education is pursued by tertiary institutions, the mix of accommodation on campus may change. The office and production facilities required will increase as a proportion of total campus accommodation, and there may be an argument for locating some of these activities off campus altogether. These activities could occupy accommodation zoned commercial, rather than educational, which gives an institution greater flexibility in housing these activities. Where distance education courses require periods of campus attendance, facilities will need to be timetabled to cater for sporadic on-campus attendance without generating the need for additional facilities.

Some tertiary institutions, particularly universities, may invest more heavily in the amenity and image of their campuses to encourage students to come to campus, in order to benefit from the campus culture and environment, in an era where it will be increasingly easy not to come to campus.

Information technology is likely to facilitate the ability of students to "shop around" for various components of degrees. The need to align facilities to need will become more dynamic as students move freely between institutions and discipline loads are less predictable.

Provision needs to be built into facilities to permit periodic recabling, although attention should be paid to the development of wireless local area networks and their suitability for tertiary institutions.

### GROUP D

Key issues regarding the impact of information technology on facilities planning include the following:

- significant funding requirements for IT investment and regular upgrades;
- increasing percentage of allocation of the overall budget to IT;
- increasing pressure to minimise building/structure costs to divert money to IT;
- the degree and speed of change in IT, *e.g.* three- to five-year replacement cycles versus 30 to 50 years for buildings;
- pressure on infrastructure;
- opportunities for partnering, *e.g.* external sponsorship of IT;
- considerable impact on the total facilities footprint as budget demands move to IT investment.

Facilities managers need to be aware of where innovation is occurring and of who or what is driving changes. They also need a clear idea of total and real costs (*e.g.* depreciation, asset replacement).



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# THE IMPACT OF STUDENT-CENTRED FUNDING ON FACILITIES

## GROUP A

The increase in student fees have produced a body of students demanding extra facilities. There is also a burgeoning expectation that they will be supported in areas where they lack pertinent skills to obtain their qualifications. Some universities in New Zealand have been obliged to provide training in word processing. There have been cases where the students have taken legal action because the course delivered allegedly did not match the course advertised.

Course providers are still being reactive rather than proactive and there is little evidence of a shift in attitude. As the student base becomes consumer conscious, universities will have to smarten up their campuses to attract their market share. It is hoped therefore that funds would be allocated to the impoverished facilities managers enabling them to refurbish public areas, particularly entry foyers and lecture theatres. Improved signage would make many campuses more user friendly. Some universities are now introducing the "one-stop shop" where students can complete all administrative tasks including enrolments.



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# THE PHYSICAL ENVIRONMENT FOR TERTIARY EDUCATION IN THE YEAR 2010

## GROUP A

Universities are often powered by political opportunism. What politicians, holding down marginal seats, or corporate philanthropists, seeking knighthood, are going to open an old building with a decommissioned floor and new roof membrane? None. Munificence must be recognised, and it will be a brave university that will not go for the brand-new building. The decision is a difficult one for the university collective during times of funding cuts and government directives to become more cost effective.

The campus fabric will not change unless the collective changes its requirements, but due to the level of inertia endemic in many of the university collectives, they will not change unless they are made to do so. The reduction in government funding and a reliance on student fees has forced the universities to review their markets and the quality of their deliverables and services. The reduction in the numbers of students from overseas is forcing a number of universities to restructure. Catastrophe is a force that can also shift a university's focus. If they are handled properly catastrophic events need not be disastrous.

People will continue to go to universities whether it is simply due to peer pressure, to reasons of status or to have the extra advantage to get the job one seeks. An analogy can be drawn between the railways and universities: The introduction of aeroplanes did not cause the demise of trains; it only caused the industry to focus on markets where the plane could not go or deliver: subways and heavy freight trains.

The introduction of computers into the hands of bright, innovative people in the corporate world will no doubt lead to a revolution in education, in the transfer of information. Why shouldn't the process be available at any time, in a quick and enjoyable way? When will quadratic equations be taught via a computer game which the student can load onto the laptop without even leaving the comfort of the bed?

What is the university of the 21st century? Is it a place where the students work and play? Is it a transforming environment, more in tune with their requirements as they patch together an education from varying international sources? Will it become more like a shopping centre with flexible learning via computer games in the amusement arcade and Internet café, and socialising in the food hall? The group was not prepared to define the definitive model but they did share examples that were heading that way.

## GROUP B

The 21st century tertiary facility will need to better recognise the full costs of land and buildings occupied solely by the facility. This recognition will lead to institutions seeking solutions to their requirements which make greater use of existing infrastructure, both public and private, or to joint-venturing with other organisations to lessen the demand for investment capital.

Technology, including information technology, will add to the choices available to students, not necessarily superseding existing choices. These choices will need to be developed collaboratively, as some options may require expenditure not only by the institution, but also by the student. E-mail and the Internet will play an increasing role in the delivery of educational services, however it is unlikely that these technologies alone will meet all the needs of all students. It can, however, be assumed that undergraduates in the next century will all be computer literate.

Libraries will continue to evolve in response to the developing technologies, but again under continuing cost pressures. Solutions as to how best they can meet their clients' needs will probably be significantly different to those currently used. Clients are likely to be required to develop skills to meet the majority of their needs without assistance from



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library staff, as staffing costs will remain under increasing pressure with the passage of time.

Whatever the physical environment will be in the future, there will be a non-negotiable requirement for institutions to ensure that their offerings are quality assured. This need will be heightened as individual students are required to meet an increased share of the cost of their courses from their own resources.

### Characteristics of a 21st century tertiary education facility

The facility will have the inherent capability to operate 24 hours per day, seven days per week, 52 weeks per year. The facility will make greater use of community space and will therefore rely less on the current model of sole occupancy of specialised facilities. It will have communications and organisational links to outside bodies; more of its administrative systems will be outsourced.

The 21st century tertiary education facility will have employer/employee relations which give greater flexibility, including remuneration which is determined on an individual rather than a collective basis. Academic staff will regard themselves as owing allegiance to their discipline rather than to their faculty. More work will be performed off campus, including at home, by both academic and administrative staff; this will be facilitated by technology but the prime catalyst will be the need to better husband increasingly scarce and expensive resources.

Twenty-first century facilities will have to continue to meet the needs of post-compulsory education for 17- to 21-year-old students, however this cohort will decline as a percentage of the total student body. Conversely, the percentage of mature age students will increase and as a consequence the student body will become more demanding and insist on more say in what they learn and in when, where and how they learn. To the extent that global information networks enable institutions to respond to the above demands, they will be a necessary area in which tertiary institutions will have to commit investment funds.

Much of what is wanted by mature age students will be associated with re-skilling, and the pressures will be for that need to be met off campus, either in the workplace or at home, rather than in dedicated on-campus facilities.



### GROUP C

**By the year 2010...**

Academics and senior administrators will be conducting more of their work from home. As tenure and remuneration is linked more to outcomes and performance than hours in the classroom or office, the control paradigm will give way to economic forces that will require high and strategic utilisation of facilities. Some academics may be provided office accommodation as part of their appointment package rather than as a right, whilst others, particularly those focused on teaching, may only come to campus part of the week for actual student contact in lectures, tutorials, labs and consultation, and possibly production of presentation and handout materials.

At least the operational aspects of the facilities management function will have been corporatised or outsourced as tertiary institutions seek to focus on their core business. Institutions will require high level professional delivery of facilities services by "expert" facilities management organisations with large labour and purchasing power. Operational aspects of facilities management will be housed off campus to the greatest degree possible, preserving the on-campus accommodation for more strategic uses.

Many tertiary institutions will have responded to the opportunities and challenges presented by information technology and the needs of the changing demographic profile of the tertiary education student. With a greater percentage of tertiary education students being mature age, often with work, financial and family commitments, the physical environment on campus will see a greater proportion of office and production facilities, in relation to teaching spaces, supporting various forms of distance education. On-campus facilities are likely to be utilised more heavily each day, each week and each year, driven both by economic considerations and the needs of the mature age student. Even undergraduates, straight from high school, are likely to need to weave their study commitments in with part-time work, to a greater degree, to support the increasing cost of higher education to students.

On-campus teaching will have moved to a more learner-centred environment. This will have implications for the types of facilities the campus must have available. There will be a shift away from the large lecture format of teaching in many subjects. In order to free up teachers to spend more time in smaller



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group sessions, in an environment of reducing government budget support and increasing staff/student ratios, greater use will need to be made of educational technology and distance delivery for the mass teaching components of courses. This will allow more sophisticated production of course material which should be an advantage for both student and institution over the large lecture format.

Tertiary institutions, particularly universities with large, ageing laboratory infrastructure, will need to reduce the on-campus facilities they use to a "quality core" in response to the ever increasing gap between the capital required and the capital available to address deferred maintenance, functional obsolescence, regulations, environmental objectives and considerations, rationalisation of dysfunctional groupings or disbursements of activities, new initiatives, increased amenity and quality of accommodation, to name but a few of the driving factors.

Tertiary institutions will have to develop more flexible facilities portfolios that can adapt to the business requirements of the organisation. There will be a need to acquire, dispose of and modify accommodation, both on and off campus, more quickly and frequently, to respond to opportunities that arise. Developing buildings on campus to last "forever" may not only tie up valuable capital in the short term but may limit the ability of an institution to dispose of, or lease out, the asset in the future when accommodation needs change. Leasing of property will be more prevalent, particularly for the more entrepreneurial elements of institutions, not only to provide for varying accommodation needs in line with the fluctuations of the business, but to place the accommodation where it is most convenient to the customer base. The ability for students to "shop around" for various components of their qualifications between institutions will also increase the volatility of accommodation requirements for various courses.

There will be an increased emphasis on developing strategic alliances between universities, industry and governments. These alliances may see increased industry presence on campus. This presence may enable tertiary institutions not only to make sound use of any surplus accommodation without disposing of it or "freezing" it, but provide a means for capital injections from the private sector which will assist institutions in arresting the decay of the physical environment.

There will be increased acceptance, by necessity, of the use of naming rights on buildings, wings of buildings, rooms, landscaped areas and the like, in order to attract external sponsorship funding. The issue of institutional bias towards sponsors and the perceived conflict of interest in some areas will need to be addressed.



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## FROM THE IDEAL TO REALITY: HOW DO WE GET THERE FROM HERE?

### GROUP A

#### The role and skills profile of the facilities manager

The term "facilities manager" is perhaps not broad enough to encompass all the roles perceived as critical to the successful management of building and physical infrastructure on tertiary campuses. Other names possible are "total asset manager" and "fac strat" (facilities strategist).

Important attributes of the role include the following:

- urban planner, adviser to others, leader, opportunity taker, promoter of Total Asset Management in a positive sense, public relations agent, risk taker, "true believer", team manager, planner, manager of people and agent of change;
- having vision, being more than just operational, being able to form and maintain strategic alliances, having commitment and passion, being effective and appropriately principled, having personal integrity, being innovative and being able to help others deal with uncertainty.

#### Professional development requirements for facilities managers and staff

The following items are considered important to professional development: contract knowledge and management; management including relevant project management; and management of multi-discipline teams and consultants.

In terms of training for staff succession, planning was considered critical to allow continuity of operations. Identification of skills gaps and provision to fill these gaps was considered essential.

#### Strategies for "sitting at the top table"

Strategies for the facilities manager to take further responsibilities include the following:

- never say no to a request from senior management but be honest as to how results can be obtained;
- tell those in power of a positive vision, not just negative observations;
- lift the profile of the facilities management unit by providing an image which could come from a higher profile of the profession as a whole;
- market the unit across the organisation, consider newsletters to publish strategies which have had positive outcomes;
- create a competitive environment by providing benchmarking of performance by different parts of the organisation; for example, where individual faculties are responsible for their own building maintenance, compare the efforts of each faculty;
- use current communication tools which people are familiar with such as rapid image, the Internet and television to communicate the efforts of the facilities managers;
- anticipate needs, lead rather than follow;
- identify opportunities and provide workable plans;
- develop good personal relations with senior management.

#### The three critical issues for total asset management of tertiary facilities

- Requirement for a constant and clear long-term service strategy by the educational organisation which will allow the asset management plan to be integrated with the business plan.
- Development strategies to highlight the need for effective asset management by the organisation; these could include the "catastrophe model" – an orchestrated catastrophe such as the closure of a building due to poor occupa-



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tional health and safety which inconveniences educational delivery and reinforces the link between educational provision and asset management;

- Development of a "real costs" approach by identifying the real costs of a good asset management strategy versus a poor asset management strategy by the organisation through appropriate benchmarking and models which relate the service strategy with the need for appropriate facilities.

GROUP D

Various international models were discussed, and the following common problems were noted:

- the difficulty of long-term planning as academics tended to focus on the present (the next two to three years) rather than the future (five or more years);
- the lack of understanding of the real costs of services and facilities by the academic users;
- the need for good quality facility information systems;
- the costs of occupational health, safety and welfare and of other regulations.

The three-stage New Zealand model required consideration of impacts and real costs of proposed programmes. The concept stage considers indicative costs of academic staff, administration services, library use and impact on facilities. Then a full impact report is prepared, with detailed costing of the various components, before submission to the Board for final approval.

Accrual accounting, student-based funding and the reduction in resources generally are forcing institutions to reconsider the appropriateness of their methods for conducting business. It is often thought that a new building or piece of equipment will solve all the problems but too frequently they only add to them, as if there has been no real long-term planning.

Capital works business plans are required and they should contain all relevant information for assessing both the capital and recurrent cost of any proposal. This includes equipment grants, which often neglected installation and recurrent costs. The fact that a large piece of electrical equipment may require an upgrade or installation of a new electrical board was not considered as part of the cost of the equipment.

To make any system work, a real commitment from top management is required.

Convincing arguments are essential to prompt management into demanding relevant information when considering new proposals. Academics must be involved in the strategic asset management process.

**Key findings**

In an ideal world the role of a facilities manager would have greater importance. By increasing the facilities manager's sphere of influence, costs could be reduced through improved business planning and strategic asset management.

To achieve these desired outcomes facilities managers need an extensive range of skills. A facilities manager needs to be a good communicator, a salesperson, a creative and lateral thinker, a strategic planner and a "true believer" with values which match those of the institution. He or she must also be reliable and ensure tasks are completed, be entrepreneurial and able to delegate and devolve responsibilities. In fact the facilities manager should ideally be all things to all people; as this is unrealistic, it is essential for other staff to complement the facilities manager's abilities. Some areas conduct personal profiles of staff to ensure that all skills are well represented in the team.

A technical background is thought to be an advantage as in many cases the facilities manager is expected to write, negotiate and manage any outsourcing contracts.

Professional training for facilities managers and staff is a lifelong learning process. Strategic leadership, team development, multi-skilling and communication are all skills which need to be developed and refined over time. Jobs are changing rapidly and retraining is essential. One organisation has a full-time training officer to address the changing needs of the staff as they go from "hands-on" to "managers of contracts".

Strategic planning needs to be process oriented. A number of the staff now required to manage this process were previously in charge of a large team of people with a variety of skills, and now they have relatively few if any people who manage contracts. As a result they have little time to develop training.

Interaction with peers within states, interstate and overseas is important as it provides perspective and assistance with issues, many of which are common across all institutions. One method is "shadowing" other facilities managers, both within and between states.





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The most important role for professional bodies at the current time is that of a lobby group. There is an urgent need for a pragmatic view to be put to legislators. Organisations such as AAPPA need to review various regulations and the effects of legislation on costs and planning of institutions.

The best way "to get to the top table" is to get there first. The provision of good quality information which is regularly updated, leadership and networking will help one stay there, as will asking challenging questions, providing information and options and being a good salesperson.



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# CONCLUSIONS

The two dominant influences on the policy environment, over the next decade, will be the universal move to implement lifelong learning and the impact of information technology. These factors will lead to changes in the delivery of education programmes and the physical facilities required by institutions, and have significant implications for facility managers.

## LIFELONG LEARNING

Lifelong learning is the central imperative in what is becoming known as the "Learning Age". It is an imperative which is driven by economic, technological and social change. The implementation of lifelong learning and the formation of a learning society are the primary recommendations of both the West report (Australia)[17] and the Fryer report (United Kingdom),[18] while the OECD has this to say: "Lifelong learning will be essential for everyone as we move into the 21st century and has to be made accessible to all".[19]

The concept of lifelong learning provides the philosophical framework which will give direction to all education sectors and particularly the tertiary sector. Its implementation will impact on the physical environment of institutions and therefore the work of facilities managers in the following ways:

- Student Numbers and Student Profile – Because lifelong learning is for all and throughout life, its implementation will clearly result in a significant increase in the quantum of education. There will also be a change in the ratio of school leavers to mature age students, as well as in the level of educational backgrounds of students.
- Methodologies and Delivery Systems – As a concept, lifelong learning requires learners to be more actively involved in the education process. Students will need to be given greater choice about what they learn, when and where they will learn and the pace at which they will progress.
- Funding Arrangements – As funding follows students, tertiary institutions will need to become increasingly demand driven as opposed to supply driven. Moreover students will have the power to demand quality amenities and support systems.

## INFORMATION AND COMMUNICATION TECHNOLOGY

Notwithstanding the advances in information technology over the past decade, workshop participants felt that the real impact of IT, on all aspects of people's lives and in particular on how one learns, has yet to occur. IT will increasingly provide the vehicle for revolutionising the delivery of education and training as well as being a tool for managing the learning environment and the learning process. As such, it will impact on tertiary institutions and therefore facilities managers in the following ways:

- Global Competition for Students – Students will increasingly choose internationally accredited programmes which are interactive and flexible in terms of time, place and content. These networks will give students access to the very best academic staff in the world.
- Student/Teacher Relationships – In an IT environment teachers are no longer the source of all knowledge. Rather they will assist learners to access information and provide support and encouragement. In short they will become facilitators and managers of the learning environment.
- Production of Interactive Courseware and On-line Programmes – To avoid the prospect of cultural domination, tertiary institutions must contribute to the development of programmes delivered via the global information networks. Because of the expense involved in this process they will need to



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consider working in partnership with each other, with government and with industry.

## FEATURES OF A SUCCESSFUL TERTIARY PROVIDER

The following summarises the defining physical features of a 21st century tertiary institution in response to the influences of lifelong learning and IT:

- an-IT rich environment complete with Internet cafés, food halls, student lounges and computer simulated laboratories with facilitators able to give advice on value-for-money courses as well as support on how to access these;
- learning resource centres which offer information and learning support, electronic access to data and to interactive CD-ROM educational programmes;
- increasing move to the use of computer simulated laboratories as an alternative to wet laboratories;
- a rich cultural and sporting environment with quality facilities which will attract students to meet and interact personally as well as electronically;
- a reduced number of traditional lecture theatres and classrooms as students increasingly access courses via CD-ROM and the World Wide Web and learn in small groups as problem-based learning is widely adopted;
- less office space as staff spend more time working from home;
- in addition to their own speciality, institutions will offer support to students undertaking programmes from interstate and overseas institutions; franchising of education products and services will be an increasing feature of the new environment;
- resources will be redirected from bricks and mortar to the acquisition of IT for the delivery of education programmes and for management; such resources will also be required for the professional development associated with the use of IT as well as for the development of quality courseware;
- tertiary institutions will be more like educational shopping centres in which students meet, interact, learn, play and socialise; in some instances they will actually be located within a shopping centre, as is the case of the Gold Coast TAFE in Australia;
- given the rapid rate of mechanical, scientific and IT equipment obsolescence, institutions will increasingly make use of public and private facilities and equipment, and are more likely to lease, rather than own facilities;
- facilities will be designed with an inherent capability of operating 24 hours per day, seven days per week and 52 weeks per year.

These characteristics, along with the workshop discussions in their entirety, apply to institutions which will continue to provide a physical site for learning. Asset management by providers of tertiary education relying wholly on on-line delivery remains to be examined.

## MAKING THE TRANSITION FROM FACILITIES MANAGER TO FACILITIES EXECUTIVE

There is general agreement that tertiary education is about to undergo a paradigm shift of the same magnitude as that witnessed in the banking sector. As in the case of the banking sector the shift will be heavily dependent on sophisticated, user-friendly and universally accessible information technology. However, making the transition from where institutions are now (with their enormously expensive, purpose built and often ageing capital stock and their less than flexible staffing structures) to where they will need to be will call for creative and sensitive decision-making. The timing of this paradigm shift and the speed at which it will occur are unknown. The question is whether it will be evolutionary, and therefore a relatively smooth transition, or revolutionary with all the associated pain and hardship.

The success, or even survival, of tertiary institutions over the next decade will depend on how well they manage to make the transition to becoming members of the "Learning Age". This will depend in part on the quality of advice about the nature and size of the IT systems and learning environments required. Such advice to the chief executives will come from the new breed of facilities executives.

This new breed will be characterised by visionaries who are able to see the "big picture" and who possess the communication skills to interpret that vision to the stakeholders. Moreover the facilities executives will not only participate in developing the institution's vision/mission but will provide advice on how the physical facilities can best be directed to achieve that mission. The new

environment in which they will be operating may require radical decisions such as divesting themselves of capital stock, moving from owning to leasing facilities and outsourcing most of the facilities support structures. Thus the facilities executives of the 21st century will need to be agents of change, visionary planners, creative strategists and entrepreneurs. They will also need to be familiar with property management, contract management and real estate.

Facilities executives will themselves become heavily dependent on IT for asset management, for space planning and management, for life-cycle cost data and for contract and construction management. Moreover, facilities executives will be members of a national or international professional association which will provide information and data to its membership, initiate relevant research and co-ordinate national and international conferences on issues related to facilities management.

## NOTES

1. Some of the themes developed in this paper are canvassed in Coaldrake and Stedman (1998), *On the Brink. Australia's Universities Confronting Their Future*, University of Queensland Press, St Lucia.
2. WEST, R. (1998), *Learning for Life: Review of Higher Education Finance and Policy*, Australia.
3. KENNY, Grace (1978), *The Shared Use of Polytechnic Accommodation*, PhD Thesis, University of London.
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10. BLACKSTONE, Tessa (1998), *Revised Approach to Considering Merger Proposals*, Circular 98/19, FEFC, Coventry, 8 June.
11. KNIGHT, Peter (1998), "Two Views on University Management", *Times Higher Education Supplement*, 24 July.
12. The University Grants Committee of Hong Kong, China, is an independent non-statutory advisory body whose members comprise distinguished overseas academics, prominent local professionals and business people, and senior locally-based academics. It has the responsibility of advising on the academic development and funding of Hong Kong's institutions of higher education.
13. The eight higher education institutions under the aegis of the UGC are City University of Hong Kong, Hong Kong Baptist University, Lingnan College, The Chinese University of Hong Kong, The Hong Kong Institute of Education, the Hong Kong Polytechnic University, the Hong Kong University of Science and Technology and the University of Hong Kong.
14. Apart from the eight UGC-funded institutions (see previous note), the Hong Kong Academy for the Performing Arts, a publicly funded conservatorium, and the Open University of Hong Kong are both degree-awarding institutions.
15. These "space norms" are based on those developed by the UK University Grants Committee and Department of Education in the 1960s and 1970s.
16. There is one exception: around 1990 under a Conservative government, one of Sweden's technical universities, CTH, became an independent foundation, autonomous from the State.
17. WEST, R. (1998), *Learning for Life: Review of Higher Education Finance and Policy*, Australia.
18. FRYER, R. (1997), *Learning for the 21st Century*, Department for Education and Employment, United Kingdom.
19. OECD (1996), *Lifelong Learning for All, Meeting of the Education Committee at Ministerial Level, 16-17 January 1996*, Paris.

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Universities and other tertiary institutions maintain buildings, sites and communications infrastructure worth many millions of dollars. A more strategic approach to asset management is essential for success in a new environment, where tertiary education is becoming increasingly competitive, direct public funding is being cut back and technology and globalisation are bringing new challenges.

What impact will new information technology have on space requirements? What steps can institutional managers take to manage risks in rapidly-changing circumstances? In what ways is the role of facilities managers changing, and what skills and tools will be required for them to do their jobs more effectively in the future?

This book provides some answers to these questions and shows how the resources invested in facilities can be made to work more efficiently in the pursuit of institutional objectives. It is based on the proceedings of an international workshop that examined current trends in tertiary education policy: a more open market, student-centredness and user choice, life-long learning and the blurring of sectoral differences.

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